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OFFICIAL GAZETTE

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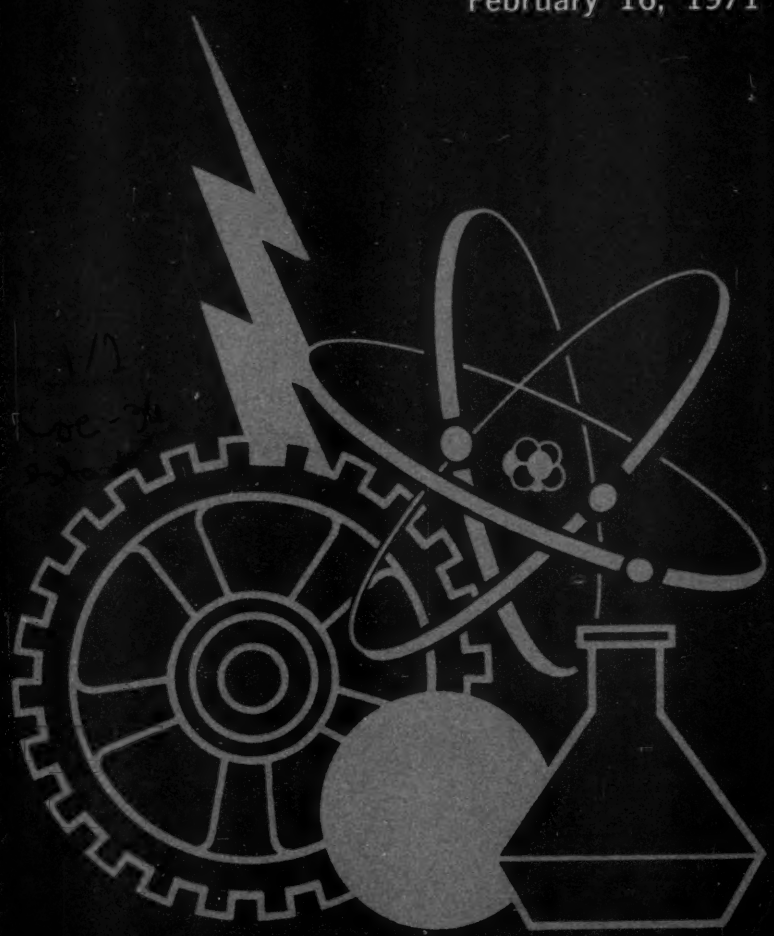
PATENTS

February 16, 1971



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 16, 1971 Volume 883 Number 3

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PATENT OFFICE NOTICES

After Final Rejection Practice

[37 CFR Part 1]

Notice of Proposed Rule Making

Notice is hereby given that pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), the Patent Office proposes to amend Title 37 of the Code of Federal Regulations by revising §§ 1.116, 1.191, 1.192, and 1.193, and by adding § 1.130.

All persons interested in presenting their views and objections and recommendations in connection with the proposed changes are invited to do so on or before March 23, 1971, on which day a hearing will be held at 2 p.m., e.s.t., in Room 8C06, Building 2, 2011 Jefferson Davis Highway, Arlington, Va. All persons wishing to be heard orally are requested to notify the Commissioner of Patents of their intended appearance. Any written comments or suggestions may be inspected by any person upon written request a reasonable time after the closing date for submitting comments.

The proposed changes, if adopted, will provide a basis for a revised procedure for treating amendments filed after a final rejection. A proposed additional section is added to incorporate the existing practice relative to affidavits.

The proposed procedure will provide that all timely filed first amendments after final rejection be entered as a matter of right, subject to the limitation that additional claims will not be entered beyond the number that would result in the total number of claims under prosecution equalling the number of claims finally rejected. Only those second and subsequent amendments which cancel claims will be entered as a matter of right. The entry and treatment of any other amendments filed at this stage will be entirely within the discretion of the examiner.

A distinction will be made between first amendments after final rejection filed within 2 months from the date of the final rejection and those filed after that period.

A first amendment after final rejection filed within 2 months of the final rejection will receive a full and complete advisory action as soon as possible after its receipt in the Patent Office. Under these circumstances, the revised procedure would permit the filing of an appeal within the period for response to the final rejection or within 1 month from the date of the advisory action, whichever is later. However, if an appeal had been filed before the mailing of the advisory action, the appeal brief would not be due until 2 months after the date of the advisory action.

Amendments filed later than 2 months after the date of the final rejection in nonappeared cases may be answered at the examiner's discretion, but no additional time will be allowed for appeal. However, if an appeal is filed in these cases, a full and complete advisory action will be rendered and the time for filing the brief will be extended to expire 2 months from the date of the advisory action.

After jurisdiction of an application transfers to the Board of Appeals, no amendments will be considered for entry except those restricted to cancellation of claims or copying claims for purposes of interference.

If new issues are presented in the claims as amended or presented after final rejection, they will be rejected in the advisory action on the ground of being drawn to new issues. These rejections will be reviewable by the Board of Appeals as "adverse decisions of examiners" (35 U.S.C. 7).

The current practice of normally making the second action on the merits final and setting of a 3-month period for response will continue. However, the practice of granting an automatic 1-month extension of time if an amendment is filed (notices of Aug. 7, 1967; 841 O.G. 1411 and of Sept. 26, 1968; 855 O.G. 1109) will be terminated, and extensions of time at this stage of the prosecution will not be encouraged. Further, any extension of time granted after a final rejection will not affect the 2-month period and the privilege of an advisory action.

The present policy concerning consideration of affidavits, declarations, and exhibits will remain unchanged.

Holding of interviews after final rejection will be at the primary examiner's discretion.

This procedure will also allow the examiner to prepare examiner's answers which simply refer to the final rejection or the advisory action in most instances.

The sections, if amended as proposed, would read as follows:

§ 1.116 *Amendments after final action.*

* * * * *

(b) A first amendment presented after final rejection will be entered and considered, but the total number of claims under prosecution may not exceed the total number finally rejected. Entry of second and subsequent amendements after final rejection will normally be limited to only those which cancel claims.

(c) A first amendement filed within 2 months after the date of the final rejection, or after appeal, will receive a full and complete advisory action. If not previously filed, an appeal may be filed in such cases within the period for response to the final rejection or within 1 month from the date of the advisory action, whichever is later. In those cases where an appeal was filed before the date of the advisory action, the appeal brief is due 2 months after the date of the advisory action.

(d) After jurisdiction of an appealed case passes to the Board of Appeals no amendments may normally be made (see § 1.191(d)). After decision on appeal, amendments can only be made as provided in § 1.198, or to carry into effect a recommendation under § 1.196.

(e) Amendments after final rejection shall not introduce new issues into the prosecution.

§ 1.130 *Affidavits, declarations, or exhibits after final rejection.*

Affidavits, declarations, or exhibits submitted with a first reply after final rejection for the purpose of overcoming a new ground of rejection or requirement made in the final rejection, shall be admitted and considered. No other affidavit, declaration, or exhibit presented after final rejection will be admitted and considered without a showing of good and sufficient reasons why they were not earlier presented.

§ 1.191 *Appeal to Board of Appeals.*

(a) Every applicant for a patent or for reissue of a patent, any of the claims of which have been twice rejected, or who has been given a final rejection (§ 1.113) may, upon the payment of the fee required by law, appeal from the decision of the primary examiner to the Board of Appeals within the time allowed for response. (See § 1.116(c).)

* * * * *

(d) The jurisdiction of an appealed case is retained by the primary examiner until the time for filing a reply to the examiner's answer (§ 1.193(b)) has expired, at which time the Board of Appeals will take jurisdiction of the same.

§ 1.192 *Appellant's brief.*

(a) The appellant shall, within 2 months from the date of the appeal, or within the time allowed for response to the action appealed from, or within the time allowed in an advisory action (§ 1.116(b)), whichever is later, file a brief, accompanied by the requisite fee. Said brief shall include all of the authorities and arguments on which he will rely to maintain his appeal, including a concise explanation of the invention which should refer to the drawing by reference characters, and a copy of the claims involved, at the same time indicating if he desires an oral hearing. Two extra copies of the brief are required if an oral hearing is requested. Upon a showing of sufficient cause the time for filing the brief may be extended to a date not later than 2 months after the original expiration date. Any longer or further extensions must be sought from the Commissioner. All requests for extensions must be filed prior to the expiration of the period sought to be extended.

* * * * *

§ 1.193 *Examiner's answer.*

* * * * *

(b) The appellant may file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within 1 month from the date of such answer.

However, if the examiner's answer states a new ground of rejection appellant may file a reply thereto within 2 months from the date of such answer; such reply may include any amendment or material appropriate to the new ground.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Approved: January 22, 1971.

RICHARD O. SIMPSON,
Acting Assistant Secretary for Science and Technology.

[FR Doc. 71-1167 Filed 1-27-71; 8:47 a.m.]

Pub. in 36 F.R. 1356-57, Jan. 28, 1971

Division-Continuation Program

[37 CFR Parts 1, 3]

Notice of Proposed Rule Making

Notice is hereby given that pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), the Patent Office proposes to amend Title 37 of the Code of Federal Regulations by revising §§ 1.41 and 1.75, adding §§ 1.60 and 3.54, and by revoking § 1.147.

All persons interested in presenting their views and objections and recommendations in connection with the proposed changes are invited to do so on or before March 23, 1971, on which day a hearing will be held at 1 p.m., e.s.t., in Room 8C06, Building 2, 2011 Jefferson Davis Highway, Arlington, Va. All persons wishing to be heard orally are requested to notify the Commissioner of Patents of their intended appearance. Any written comments or suggestions may be inspected by any person upon written request a reasonable time after the closing date for submitting comments.

The proposed program is intended to replace the current Rule 147 divisional and streamline continuation programs (notices of Feb. 11, 1966, 824 O.G. 1 and Oct. 14, 1969, 869 O.G. 1). The proposed program follows generally the present Rule 147 practice and expands its use to include continuations. No new specification, claims or oath would be required under the proposed practice since a copy of the original application papers would be made by the Patent Office.

Title 35 U.S.C. 121 specifically allows filing of a divisional application without signing by the inventor.

In regularly filed continuation or divisional applications, the only statement in the oath or declaration of the continuing case (37 CFR 3.17, 3.17(a)) which is not sworn to in the original application is that the continuing application discloses and claims only subject matter disclosed in his original application. Since the continuing application as filed is an exact duplicate of the original application, the additional statement is superfluous. Acceptance of a continuing application without a new execution by the applicant is, therefore, within the broad authority conferred by 35 U.S.C. 6 and 120.

The proposed changes follow:

§ 1.41 [*Amended.*]

1. Section 1.41 is proposed to be amended by revising the parenthetical expression at the end of paragraph (a) to read "(See § 1.60)."

2. A new § 1.60 is proposed to be added, the full text of which reads as follows:

§ 1.60 *Continuing application for invention disclosed and claimed in a prior application.*

A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application. If the application papers comprise a copy of the prior application as filed, prepared and certified by the Patent Office, signing and execution by the applicant may be omitted. Certification may be omitted if the copy does not leave the custody of the Patent Office. Only amendments reducing the number of claims or adding a reference to the prior application (§ 1.78(a)) will be entered before calculating the filing fee and granting of the filing date.

3. Section 1.75 is proposed to be amended by revising paragraph (d)(2) to read as follows:

§ 1.75 *Claim(s).*

* * * * * * *

(d) * * *

(2) See §§ 1.141 to 1.146 as to claiming different inventions in one application.

* * * * * * *

§ 1.147 [*Revoked.*]

4. Section 1.147 is proposed to be revoked.

5. A new § 3.54 is proposed to be added to read as follows:

§ 3.54 *Division-continuation program application transmittal form.*

IN THE UNITED STATES PATENT OFFICE

THE COMMISSIONER OF PATENTS,
Washington, D.C. 20231

SIR: This is a request for filing a

☐ Continuation
☐ Divisional

application under 37 CFR 1.60.

of pending original application Serial No. _____ filed on _____ (date) of _____ (inventor)

for _____ (title of invention)

1. ☐ The filing fee is calculated below:

CLAIMS AS FILED, LESS ANY CLAIMS CANCELED BY AMENDMENT

For	Number filed		Number extra		Rate	Basic fee $65
Total claims	−10=		X		$2	=
Independent claims	−1=		X		10	=
Total filing fee						

2. ☐ Please charge my Deposit Acount No. _____ in the amount of $_____. A duplicate copy of this sheet is enclosed.

3. ☐ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Account No. _____. A duplicate copy of this sheet is enclosed.

4. ☐ A check in the amount of $_____ is enclosed.

5. ☐ Cancel claims _____

6. ☐ Amend the specification by inserting before the first line the sentence:
—This is a ☐ Continuation ☐ division of application Serial No. _____, filed _____.

7. ☐ The original application is assigned to _____.

8. ☐ The power of attorney in the original application is to _____,

a. ☐ The power appears in the original papers of the original application.

b. ☐ Since the power does not appear in the original papers, a copy of the power in the original application is enclosed.

_____
(Signature)

☐ Inventor(s)
☐ Assignee of Complete Interest
☐ Attorney or agent of record in original application

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Approved: January 22, 1971.

RICHARD O. SIMPSON,
Acting Assistant Secretary for Science and Technology.

[FR Doc. 71-1168 Filed 1-27-71; 8:47 a.m.]

Pub. in 36 F.R. 1356-57, Jan. 28, 1971

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,570,193, Bieber and Sumpter, HIGH TEMPERATURE ALLOYS AND ARTICLES; **2,570,194,** same, PRODUCTION OF HIGH-TEMPERATURE ALLOYS AND ARTICLES; **3,046,108,** H. L. Eiselstein, AGE-HARDENABLE NICKEL ALLOY; **3,048,485,** C. G. Bieber, HIGH STRENGTH CREEP RESISTING ALLOY, **filed** Oct. 25, 1968, D.C., S.D. Tex. (Houston), Doc. 68-H-894, *The International Nickel Company, Inc.* v. *Cameron Iron Works, Inc.* Notice of dismissal under Rule 41(a)(1)(i), Oct. 9, 1970.

2,570,194. (See 2,570,193.)

2,703,579, Merancy and Weisz, AUTO CAR WASHING MACHINE; **3,304,565,** H. Fuhring, CLEANING INSTALLATIONS FOR VEHICLES, **filed** Aug. 18, 1970, D.C. Ariz. (Phoenix), Doc. C-70-489, *California Car Wash Systems, Inc.* v. *Hurricane Car Wash Systems, Inc.*

3,028,713, Kennedy, Martinez, Paprzycki and Stabilito, ARTICLE COUNTING AND LOADING MACHINE, **filed** Nov. 29, 1967, D.C.N.J. (Camden), Doc. C-1213-67, *Edward J. Kennedy et al.* v. *Lasko Company, Inc.* Order of dismissal without prejudice, Oct. 28, 1970.

3,046,108. (See 2,570,193.)

3,048,485. (See 2,570,193.)

3,052,319, R. K. Swanson, CANTILEVER SHOPPING CART AND COUNTER ASSEMBLY; **3,517,773,** same, CHECK-OUT SYSTEM AND COUNTER FOR USE WITH CANTILEVER SHOPPING CART, **filed** Oct. 27, 1970, D.C., W.D. Okla. (Oklahoma City), Doc. 70-530-C, *Russel K. Swanson and United Steel & Wire Company* v. *Folding Carrier Corporation.*

3,061,271, L. T. Jones, RIGGING STRUCTURE FOR ERECTING STORAGE ENCLOSURES, **filed** Nov. 15, 1966, D.C. Del. (Wilmington), Doc. 3283, *Lucian T. Jones, doing business as Seaford Welding Co.* v. *O. A. Newton & Son Company, Elmer E. Hasselbring and Textron, Inc.*

3,076,768, F. J. Boylan, DEFOAMER; **3,468,806,** same, METHOD OF CONTROLLING FOAMING, **filed** Jan. 3, 1969, D.C., S.D.N.Y., Doc. 69-C-21, *Drew Chemical Company* v. *Hercules Incorporated.* Stipulation and order of dismissal without prejudice, Oct. 1, 1970.

3,089,310, E. Torti, TRENCH SHORING MACHINE, **filed** Oct. 30, 1970, U.S. Ct. of App., 1st Cir., Massachusetts (Boston), Doc. 7750, *Shields-Jetco, Inc. et al.* v. *Emanuel Torti.*

3,092,404, W. MacWilliam, PACKED SCREW THREADED GLAND TYPE TUBE COUPLING FOR THIN WALLED TUBING, **filed** Oct. 26, 1970, D.C. Conn. (New Haven), Doc. 14103, *The Weatherhead Company* v. *Scovill Manufacturing Company.*

3,246,336, Baribo, Porter, Turner and Wright, MOLASSES FEED BLOCKS AND METHOD OF PREPARATION AND USE, **filed** Oct. 26, 1966, D.C. Kans. (Wichita), Doc. KC-2588, *A. E. Staley Manufacturing Company* v. *Harvest Brand Inc., doing business as Stockade Products.* Decision of the court, patent invalid. Defendant's counterclaim denied; judgment for the defendant, Oct. 13, 1970.

3,304,565. (See 2,703,579.)

3,343,961, H. Truax, METHOD FOR TREATING SOYBEANS AND THE LIKE USING INFRA-RED HEAT, **filed** Oct. 23, 1970, D.C., S.D. Iowa (Des Moines), Doc. 10-135-C-2, *Mix-Mill, Inc. and Harry Truax & Sons Company, Inc.* v. *More Life, Ltd. and Andrew J. McCormick.* Same, **filed** Oct. 23, 1970, D.C., S.D. Iowa (Des Moines), Doc. 10-136-C-2, *Mix-Mill, Inc. and Harry Truax & Sons Company, Inc.* v. *Triple "F" Feeds, Inc.*

3,383,452, Park and Campbell, MUSICAL INSTRUMENT; **Re. 26,521,** D. M. Park, AUTOMATIC REPETITIVE RHYTHM INSTRUMENT TIMING CIRCUITRY, **filed** Oct. 16, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2581, *Seeburg Corp., etc.* v. *Wurlitzer Co., etc.*

3,468,806. (See 3,076,768.)

3,450,080, Adams and Davis, TROLLEY SPACING DEVICE, **filed** Mar. 18, 1970, D.C. Kans. (Wichita), Doc. W-4336, *Lowell K. Adams, Albert D. Davis and Kenneth Monfort* v. *National Beef Packing Company.* Consent judgment, patent valid and owned by plaintiffs. Counterclaim dismissed with prejudice, Oct. 26, 1970.

3,474,386, E. A. Link, ELECTRICAL CONNECTOR, **filed** Oct. 26, 1970, D.C. Oreg. (Portland), Doc. C-70-714, *RTE Corporation* v. *Westinghouse Electric Corporation.*

3,498,485, B. L. Godbersen, BOOM AND FORK LIFT APPARATUS, **filed** Oct. 29, 1970, D.C., N.D. Ind. (South Bend), Doc. 70-S-153, *Midwest Industries, Inc.* v. *Freeman Industries Corporation.*

3,511,352, G. B. Greene, AUTOMATIC BAR TYPEWRITERS AND THE LIKE HAVING ROLL-CAM TYPE DRIVE MECHANISMS, **filed** Oct. 30, 1970, D.C.N.J. (Newark), Doc. C-1467-70, *George B. Greene* v. *The Singer Co.*

3,512,807, H. J. Moran, MANIFOLD FOR INFLATABLE LIFE PRESERVERS AND THE LIKE, **filed** Oct. 27, 1970, D.C.N.J. (Newark), Doc. 1446-70, *Switlik Parachute Company, Inc.* v. *Halkey-Roberts Corp.*

3,517,773. (See 3,052,319.)

Re. 26,521. (See 3,383,452.)

Certificates of Correction for the Week of Feb. 16, 1971

D. 217,895	3,504,991	3,519,468
D. 218,861	3,505,905	3,519,809
Re. 26,766	3,507,538	3,519,815
3,349,416	3,510,521	3,520,046
3,410,687	3,510,707	3,520,221
3,412,019	3,511,178	3,521,348
3,420,615	3,512,689	3,522,340
3,432,744	3,513,803	3,526,036
3,434,791	3,516,182	3,526,327
3,441,537	3,516,725	3,528,098
3,454,630	3,516,942	3,528,347
3,455,469	3,517,294	3,528,349
3,475,397	3,517,390	3,529,255
3,475,652	3,517,857	3,529,340
3,479,485	3,518,261	3,530,980
3,482,884	3,518,921	3,535,160
3,496,743	3,519,464	

Disclaimer

3,353,079.—*John J. Saeli*, Rochester, N.Y. WINDSHIELD WIPER CONTROL SYSTEM. Patent dated Nov. 14, 1967. Disclaimer filed Dec. 4, 1970, by the assignee, *General Motors Corporation*.

Hereby enters this disclaimer to claim 1 of said patent.

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents final decision have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,265,679, M. B. Black III, E. E. Faust, W. S. Barnhart and R. Netsch, CHEMICAL PRODUCT AND METHOD FOR ITS MANUFACTURE, decided Sept. 22, 1970, Interference No. 96,221, claim 10.

Patent No. 3,306,218, J. P. Reeves, METHOD OF AND APPARATUS FOR ELEVATING LIQUIDS AND SEMI-LIQUIDS, decided Apr. 29, 1970, Interference No. 96,489, claim 1.

Patent No. 3,310,659, G. Apostle, D. P. Carlson and P. J. Pollard, BOWLING SCORE COMPUTER, decided Nov. 4, 1970, Interference No. 96,899, claim 23.

Patent No. 3,320,355, A. R. Booker, HEAT SHRINKABLE CONNECTOR FOR ELECTRICAL WIRE, decided Sept. 22, 1970, Interference No. 96,432, claims 1 and 3.

Patent No. 3,426,039, S. W. Osborn, E. Broderick and J. L. Villa, PRODUCTION OF VICINAL EPISULFIDES BY THE OXIDECATALYZED REACTION OF AN ALKYLENE OXIDE AND SULFUR-DONOR, decided Dec. 16, 1970, Interference No. 97,061, claims 1, 2, 3, 5, 7, 10, 13 and 14.

Patents Available for Licensing or Sale

3,448,781. ROTATABLE BLADE SABRE SAW. John J. Angelucci, 359 10th Ave., Bethlehem, Pa., 18018.

3,491,625. FLOATING TOOL HOLDER. Lockwood D. Burton, 3260 Bridle Path Lane, Dresher, Pa., 19025.

3,525,248. PRESS. Th. Kieserling & Albrecht, Solingen, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,530,747. CENTERED CLAMPING DEVICE. Th. Kieserling & Albrecht, Solingen, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,531,013. CONTAINER CLOSURE HAVING FASTENING MEANS. Mauser-Kommandit-Gesellschaft, Cologne, Germany. Corespondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,535,667. ELECTRICAL SAFETY DEVICE. Henry C. Harnish, Jr. and Anthony J. Orsello, Elcock Ave., Boonton, N.J., 07005.

3,537,761. TRACK PLATE FOR ENDLESS TRACK VEHICLES. John Olbermann, Jr., 11735 N. 19th Ave., #18, Phoenix, Ariz., 85029.

3,543,441. VERTICALLY SLIDABLE DOOR. Gordon LaPorte, Lakeside School, Spring Valley, N.Y., 10977.

3,543,672. SMOKELESS CHARCOAL FIRED GRILL. Anthony L. Payonk, 4148 Bridge St., Whitehall, Pa., 18052.

3,544,103. RESILIENT CRADLE EXERCISE APPARATUS. Milo G. Conable, 5356 15th Ave., Sacramento, Calif., 95820.

3,546,945. FLUID SAMPLER. William H. Collins, 1002 Chipley St., Baker, La., 70714.

3,556,235. UNDERWEIGHT CAN DETECTING AND FILLING APPARATUS. Robert F. Moreno, 946 Bloomwood Road, San Pedro, Calif., 90731.

Arno Hornemann of Wesel, Germany, is prepared to grant exclusive or non-exclusive license on reasonable terms and conditions under the following patent.

Inquiries should be addressed to Anderson, Spangler & Wymore, 1700 Broadway, Denver, Colo., 80202.

3,478,882. ANTI-BACKFLOW DRAINAGE SYSTEM.

The following 3 patents are offered by John W. Barnd, 32 Hollybrook Road, Paramus, N.J.

3,351,128. MULTI-ZONE TEMPERATURE CONTROL.

3,496,991. FLUID TEMPERATURE REGULATING METHOD AND APPARATUS.

3,515,345. MULTI-ZONE TEMPERATURE CONTROL.

The General Electric Company is prepared to grant nonexclusive licenses under the following 10 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Manager—Technology Marketing Operation, General Electric Company, 1 River Road, Schenectady, N.Y., 12305.

3,489,181. FLUID AMPLIFIER POSITION CONTROL SYSTEM.

Applications for license under the following 2 patents may be addressed to: General Electric Company, 1 River Road, Bldg. 41, Room 106, Schenectady, N.Y., 12305. Attention: Patent Counsel.

3,486,393. SCREW POSITIONING DRIVE FOR ROLLING MILLS.

3,508,425. TENSION LIMIT MODIFICATION CONTROL.

Applications for license under the following 7 patents may be addressed to: General Electric Company, Appliance Components Division, 1635 Broadway, Fort Wayne, Ind., 46804. Attention: Patent Counsel.

3,496,132. VISCOSITY CONTROL ADDITIVES IN POLYAMIDE ACID SOLUTIONS.

3,138,418. FASTENING MEANS FOR SECURING A FLUORESCENT LAMPHOLDER TO A PANEL.

3,122,405. LAMPHOLDER.

3,122,404. LAMPHOLDER.

3,060,400. FLUORESCENT LAMPHOLDER WITH QUICK-CONNECT TERMINALS.

3,060,399. WIRING DEVICE TERMINAL CONNECTING MEANS.

2,973,500. BI-PIN FLUORESCENT LAMPHOLDER WITH NEW INSERTION MEANS.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 9, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-15-69
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-01-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-09-69
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-03-69
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-02-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	4-09-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-01-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-01-69
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-24-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	10-16-69
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	5-04-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	12-01-69
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	10-01-69
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	10-02-69
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	2-03-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	12-24-69

Expiration of patents: The patents within the range of numbers indicated below expire during February, 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,667,637 to 2,670,467, inclusive
Plant Patents..... Numbers 1,248 to 1,259, inclusive

REISSUES

FEBRUARY 16, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

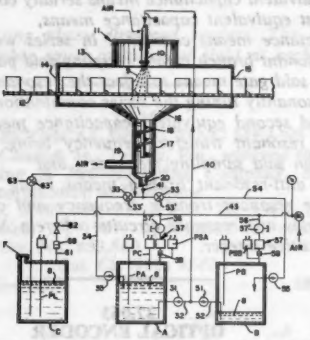
27,058
RECIRCULATING SYSTEM FOR FLOWABLE MATERIALS

Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratford, Conn., a corporation of Connecticut

Original No. 3,424,125, dated Jan. 28, 1969, Ser. No. 634,725, Apr. 28, 1967. Application for reissue Aug. 26, 1969, Ser. No. 869,969

Int. Cl. B05c *11/10*

U.S. Cl. 118—7 **12 Claims**



A system for automatically and continuously supplying and recirculating a normally flowable material to a pneumatic spray gun station and for automatically replenishing the flowable, sprayable material as it is consumed.

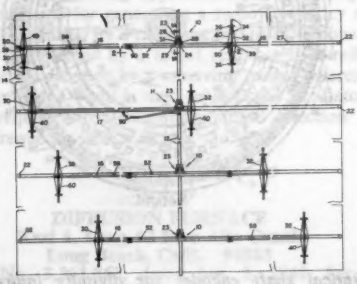
27,059
REVERSIBLE IRRIGATION LINES

Gregory J. Wieck, Enterprise, Oreg. 97828

Original No. 3,447,751, dated June 3, 1969, Ser. No. 654,809, July 20, 1967. Application for reissue Sept. 12, 1969, Ser. No. 866,411

Int. Cl. A01g *25/02*

U.S. Cl. 239—212 **23 Claims**



A long hose having sprinklers at both ends forms, with a cable running over a reversible, powered capstan, an endless, reversible towline. The length of the hose is about one-half of the length of the area to be irrigated and the hose is advanced through an injection tube at the central portion of the area to be irrigated, and water under pressure supplied to the tube enters the hose through check valves in thick-walled coupling portions spaced along the hose. The check valves are in the form of elastic sleeves fitting in the coupling portions, each sleeve normally covering two oppositely disposed openings in the coupling portion and adapted to buckle from the higher water pressure in the injection tube to admit water into the hose. Each sleeve preferably has stiff backing plates on its inside and plugs on its outside filling the openings in the coupling portion. The openings preferably are elliptical. Washing chambers at the ends of the injection tubes wash the hose before it enters the seals in the injection tubes. In one construction, two hoses with sprinklers are disposed in parallel relationship in one side of a field with two cables connecting their ends and forming an endless towline therewith, one cable being on a capstan of a drive unit midway between two sides of the field. Two other parallel hoses and cables are positioned in the other half of the field and are pulled by a second capstan of the drive unit. In another construction, a power unit midway between two sides of the field pulls two parallel cables to pull two hoses through injection tubes from one side of the field to the center of the field. The injection tubes then are disconnected from a fixed pipeline in the first half of the field, the cables are disconnected from the hoses, the hoses and injection tubes are towed by a tractor to the second half of the field, the injection tubes are connected to a pipeline in the second half of the field, the cables are connected to the other ends of the hoses, and the power unit pulls the hoses to the power unit from the far side of the second half of the field.

27,060
METHODS FOR THE VULCANIZING OF PREFORMED TIRES

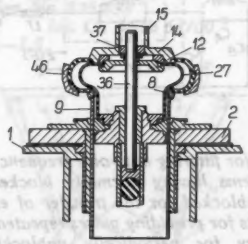
Walter Balle, Dornigheim, and Paul Musch, Bergen-Enkheim, Germany, assignors, by mesne assignments, to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Original No. 3,396,221, dated Aug. 6, 1968, Ser. No. 429,097, Jan. 29, 1965. Application for reissue Nov. 10, 1969, Ser. No. 870,240

Claims priority, application Germany, Jan. 30, 1964, H 51,533

Int. Cl. B29n *5/02, 5/18*

U.S. Cl. 264—315 **6 Claims**

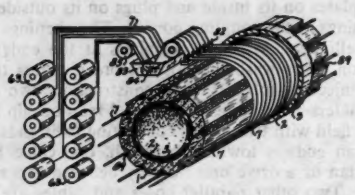


Method for molding and vulcanizing tires in which a raw tire is engaged by portions thereof and is supported in spaced relation to portions of a vulcanizing press while the tire body is expanded by internal pressure. The mold portions are closed on the tire body so both mold portions engage the tire body simultaneously and confine the tire body during vulcanization and thereafter the mold portions separate from the respective sides of the tire body at the same time.

27,061
METHOD OF MAKING A REINFORCED COMPOSITE CONCRETE PIPE

David Rubenstein, San Diego, Calif., assignor to Chem-Stress Industries, Inc., a corporation of California

Original No. 3,340,115, dated Sept. 5, 1967, Ser. No. 427,861, Jan. 25, 1965, which is a division of Ser. No. 702,050, Dec. 11, 1957, now Patent No. 3,177,902, which is a continuation-in-part of Ser. No. 668,285, June 25, 1957, and Ser. No. 345,084, Mar. 27, 1953, both now abandoned, and Ser. No. 229,852, June 4, 1951, now Patent No. 2,850,890, dated Sept. 9, 1958. Application for reissue May 7, 1969, Ser. No. 830,896
Int. Cl. B32b *33/00*
U.S. Cl. 156—86 34 Claims

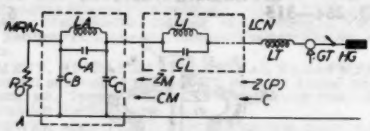


Methods of making reinforced concrete pipes which are substantially impervious to the entrance of adverse chemicals. The pores at the outside or inside surfaces of the concrete pipe are filled and covered with a polymerizable polymeric resin composition with glass fibers being embedded in the resin composition.

27,062
LOW PASS FILTER FOR COUPLING CONTINUOUS SIGNAL THROUGH PERIODICALLY CLOSED GATE

Alfred Leo Maria Fettweis, Bochum, Germany, assignor to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware

Original No. 3,303,438, dated Feb. 7, 1967, Ser. No. 213,375, July 30, 1962. Application for reissue Feb. 26, 1968, Ser. No. 709,507
Claims priority, application Belgium, July 28, 1961, 606,649
Int. Cl. H03h *7/02*
U.S. Cl. 333—70 5 Claims



5. A filter for filtering out voice frequencies in resonant transfer systems having normally blocked gate means which are unblocked for the transfer of energy,

pulse means for providing pulses repeated at a sampling frequency for periodically unblocking said gate means,

means for resistively terminating said filter,

said filter comprising quadripole network means connected to said means for resistively terminating said filter,

said quadripole network means comprising first equivalent shunt capacitance means and series impedance means providing a pass band filter in the voice frequency range,

anti-resonant branch means terminating said pass band filter on the side of said gate means,

the resonant frequency of said anti-resonant series branch means being larger than the cut-off frequency provided by said pass band filter and smaller than half the sampling frequency,

said anti-resonant series branch means providing a pair of attenuation poles lower than the sampling frequency,

there being one attenuation pole located between the cut-off frequency and the half sampling frequency and another attenuation pole occupying the symmetrical value with respect to the half sampling frequency whereby the filtering properties of said quadripole network means are improved by increasing the filter attenuation immediately beyond the cut-off frequency,

said anti-resonant branch means comprising second equivalent capacitance means serially coupled to said first equivalent capacitance means,

inductance means connected in series with said anti-resonant branch means coupling said pass band filter to said gate means to affect the resonant transfer by resonantly tuning the series combination of said first and second equivalent capacitance means,

said resonant transfer frequency being much larger than said sampling frequency, and

said anti-resonant branch means being capacitive at the resonant transfer frequency and comprising N series anti-resonant circuits, wherein N can be any positive integer.

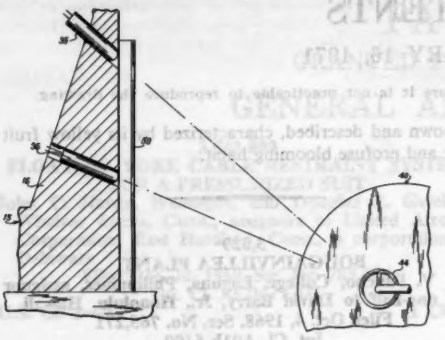
27,063
OPTICAL ENCODER

John Fisher, Aurora, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio, a corporation of Ohio

Original No. 3,388,392, dated June 11, 1968, Ser. No. 393,807, Aug. 24, 1964, which is a continuation of abandoned application Ser. No. 56,590, Sept. 16, 1960. Application for reissue June 30, 1969, Ser. No. 847,478
Int. Cl. G08c *9/06*
U.S. Cl. 340—347 16 Claims

Optical shaft encoder for digitally indicating shaft position. Encoder has code wheel with a plurality of circular binary code zones and a plurality of reader units, one for each zone for receiving light transmitted through the wheel to read the zones. A mask is positioned between the light source and reader units and has slits, one for each zone, through which the light passes. The slits increase in circumferential extent proceeding outwardly of the wheel and have sides which lie along the radii of

the code wheel axis. A single code zone is read to obtain two digits of a number representing the position of the



wheel by using phase displaced readers. The slits are such to provide equal amounts of light at each reader.

27,064

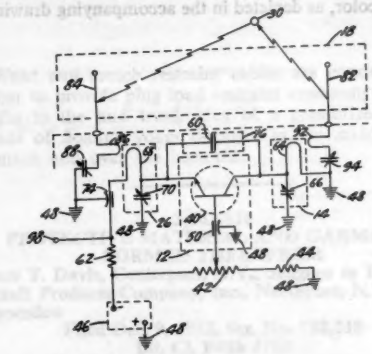
ELECTRICAL DETECTING MEANS

Lincoln H. Charlot, Jr., Tampa, Fla., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn., a corporation of Delaware

Original No. 3,407,403, dated Oct. 22, 1968, Ser. No. 616,924, Feb. 17, 1967. Application for reissue July 24, 1969, Ser. No. 853,560

Int. Cl. G01s *9/42*

U.S. Cl. 343—7.5 16 Claims



An electrical detecting apparatus utilizing a frequency shifting oscillator for generating a radio frequency signal which is transmitted by a radiating means in a propagated wave and intercepted by a target resulting in a reflected wave which is detected by a receiving means wherein the received reflected wave is used to shift the oscillator operating frequency for indicating target detection by a Doppler frequency shift is shown.

27,065

DIFFUSION FURNACE

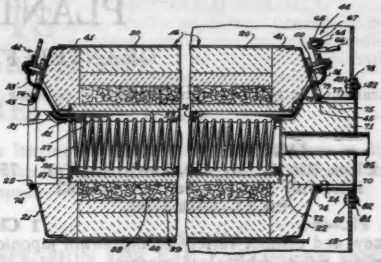
Karl A. Lang, 93 Rivo Alto Canal, Long Beach, Calif. 90803

Original No. 3,361,863, dated Jan. 2, 1968, Ser. No. 447,343, Apr. 12, 1965. Application for reissue Dec. 23, 1969, Ser. No. 887,782

Int. Cl. H05b *3/66*

U.S. Cl. 13—25 17 Claims

A diffusion furnace structure having a cabinet which supports stacked modules, each of which includes a drawer tray carrying an elongated capsule enclosing a heating element, the element being electrically connected to the furnace controls such that the element can be quickly disconnected from the cabinet when the tray is opened; and a plurality of metal leaves constituting a



part of the electrical conectors for a heating element, and which are bendable to facilitate axial removal of the element through the opening in either of the ends of an elongated diffusion furnace capsule or the like.

27,066

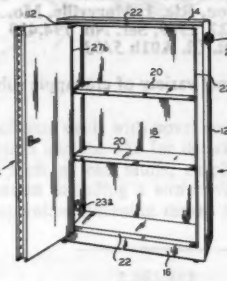
SAFETY STORAGE CABINET

Clarence E. Williams, % A & A Sheet Metal Products, 644 N. Orleans, Chicago, Ill. 60610

Original No. 3,403,954, dated Oct. 1, 1968, Ser. No. 610,053, Jan. 18, 1967. Application for reissue July 24, 1969, Ser. No. 853,559

Int. Cl. A47b *96/00*

U.S. Cl. 312—351 6 Claims



Storage cabinet is for combustible materials and automatically closes after opening and when retained in open position it automatically closes when heated.

27,067

BASKETBALL NET ANTI-WHIP DEVICE

Larry Michael, 229 W. North St., Ada, Ohio 45810

Original No. 3,313,539, dated Apr. 11, 1967, Ser. No. 404,587, Oct. 19, 1964. Application for reissue Mar. 24, 1969, Ser. No. 835,833

Int. Cl. A63b *63/00*

U.S. Cl. 273—1.5 13 Claims

A conventional basketball net having stiffening means cooperating therewith to prevent whipping of the net over the support ring.

PLANT PATENTS

GRANTED FEBRUARY 16, 1971

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,026
LIGUSTRUM PLANT

Richard Clem, Rte. 1, Box 470, Lewisville, Tex. 75067

Filed July 30, 1968, Ser. No. 748,882
Int. Cl. A01h 5/00
U.S. Cl. Plt.—54 1 Claim

1. A new and distinct variety of *Ligustrum japonicum* characterized by its white leaf margins.

3,027
DISTINCT VARIETY OF ROSE PLANT

Eldon C. Curtis, Dallas, Tex., assignor to E. V. Kimbrew, Wills Point, Tex.

Filed Dec. 2, 1968, Ser. No. 780,609
Int. Cl. A01h 5/00
U.S. Cl. Plt.—16 1 Claim

A new and distinct variety of hybrid tea rose plant produced by crossing Peace on Hawaii, Plant Pat. No. 1,833.

3,028
CRABAPPLE TREE

Johnn Lee Thompson, Rte. 1, Maryville, Mo. 64468

Filed Jan. 27, 1969, Ser. No. 794,429
Int. Cl. A01h 5/03
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of crabapple substantially as shown and described, characterized by its yellow fruit color and profuse blooming habit.

3,029
BOUGAINVILLEA PLANT

Juan V. Pancho, College, Laguna, Philippines, assignor of one-half to David Barry, Jr., Honolulu, Hawaii

Filed Oct. 4, 1968, Ser. No. 765,271
Int. Cl. A01h 5/00
U.S. Cl. Plt.—54 1 Claim

1. A new and distinct variety of Bougainvillea plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of multiple bracts borne on arching stems in sets of three upon three upon three, ranging up to 36 bracts, with each set of bracts arising in lieu of flowers where a flower would normally be produced and diminishing in size through each tripling from about 1½ inches in diameter to about 1/16 inch in diameter, giving a tufted appearance to the bract cluster and appearing from a distance like clustered roses, and a distinctive and attractive Light Mallow Purple (Ridgway) bract color, generally corresponding to a soft light pink color, as depicted in the accompanying drawing.

PATENTS

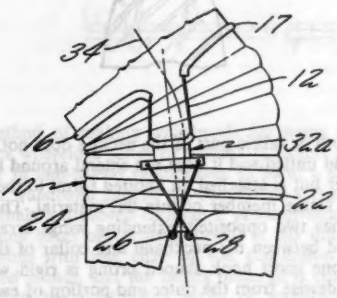
GRANTED FEBRUARY 16, 1971

GENERAL AND MECHANICAL

3,562,809
FLOATING YOKE CABLE RESTRAINT SYSTEM FOR A PRESSURIZED SUIT

John C. Hardy, Weatogue, and Douglas E. Getchell, Windsor Locks, Conn., assignors to United Aircraft Corporation, East Hartford, Conn., a corporation of Delaware

Filed Dec. 20, 1968, Ser. No. 785,604
Int. Cl. A62b *17/00*
U.S. Cl. 2—2.1 1 Claim

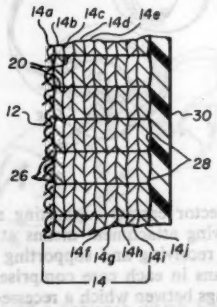


Waist and crotch restraint cables are connnected together to provide plug load restraint continuity from the thighs to the mid trunk area of a pressurized suit by means of floating yokes disposed in the middle of the stomach and over the buttocks.

3,562,810
PROTECTIVE MATERIAL AND GARMENTS FORMED THEREFROM

Bruce T. Davis, Centerport, N.Y., assignor to Davis Aircraft Products Company, Inc., Northport, N.Y., a corporation

Filed Dec. 9, 1968, Ser. No. 782,218
Int. Cl. F41h *5/08*
U.S. Cl. 2—2.5 9 Claims

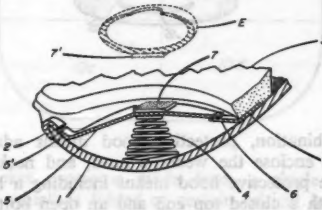


Protective material and more particularly, protective garments, resistive to penetration by flying missiles, such as bullets, shrapnel and the like, are fabricated by securing and tensioning a number of layers of ballistic material together along paths spaced within a predetermined range to compact the layers so as to provide high resistance to penetration and to deflect objects impinging thereagainst while leaving the layers sufficiently resilient to distribute the force of impact over a large area bordering the point of impact.

3,562,811
SUSPENSION FOR EAR ENCLOSURE INSIDE A PROTECTIVE HELMET

Clayton H. Allen, Wellesley, Mass., assignor to Bolt Beranek and Newman Inc., Cambridge, Mass., a corporation of Massachusetts

Filed May 21, 1969, Ser. No. 826,320
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 3 Claims

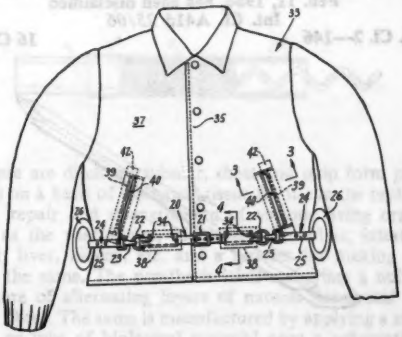


This disclosure deals with novel suspensions within protective helmets and the like for detachably-supporting ear enclosures such as ear muffs, earphones, and the like, said suspension including a strap overlying a spring and having cooperative fastening means for a detachable ear enclosure.

3,562,812
SAFETY HAND HOLD FOR TANDEM RIDERS

William R. Greggains, 712 N. James St., Rome, N.Y. 13440

Filed May 21, 1969, Ser. No. 826,508
Int. Cl. A41d *1/00*
U.S. Cl. 2—94 1 Claim

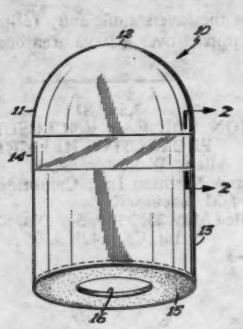


An adjustable length strap having hand holds at the ends thereof to encircle the waist of the driver of a motorcycle or the like and with the hand holds gripped by the rear tandem rider. The strap may be built into a safety jacket to be worn by the leading rider and the jacket may have safety gripping slots as an alternate means to be used by the rear rider.

3,562,813
NECK CLOSURE FOR PROTECTIVE HOOD DEVICE

Terrence F. Origer, Northfield, Minn., assignor to G. T. Schjeldahl Company, Northfield, Minn., a corporation of Minnesota

Filed July 3, 1969, Ser. No. 838,830
Int. Cl. A42b 1/04, 3/02
U.S. Cl. 2—3 4 Claims

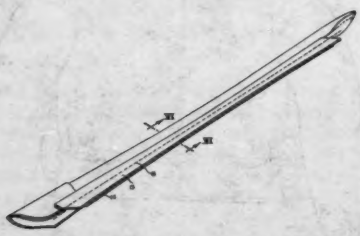


In combination, protective hood means adapted to cover and enclose the wearer's head, and neck closure means, the protective hood means including a hood enclosure with a closed top end and an open bottom end, and fabricated from gas impermeable flexible film of transparent heat resistant material, the neck closure means being disposed adjacent the open end of the hood and adapted to snugly fit about the neck of the wearer, the neck closure means comprising an annular ring of generally self-supporting elastomeric film.

3,562,814
NECKTIE LINING AND NECKWEAR CONSTRUCTION

Myron H. Ackerman, New York, N.Y., assignor to Collins & Aikman Corporation, New York, N.Y., a corporation of Delaware

Continuation-in-part of application Ser. No. 539,799, Apr. 4, 1966. This application Feb. 6, 1969, Ser. No. 796,962
The portion of the term of the patent subsequent to Feb. 11, 1986, has been disclaimed
Int. Cl. A41d 25/06
U.S. Cl. 2—146 16 Claims

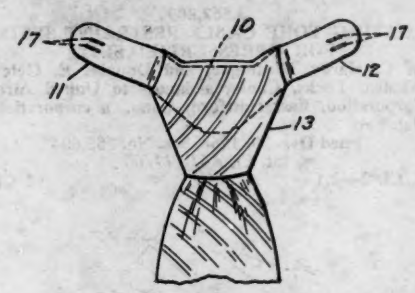


A necktie is disclosed having a double-layer lining, with the layers being superimposed upon one another to be substantially coextensive in length and width. The layers are secured together in order to maintain their positions relative to one another, prior to securing the two layers to the tie casing.

3,562,815
PRETIED NECKTIE

Percy R. Graham, 7342 24th Ave. NW., Seattle, Wash. 98107

Filed June 2, 1969, Ser. No. 829,378
Int. Cl. A41d 25/08
U.S. Cl. 2—153 3 Claims

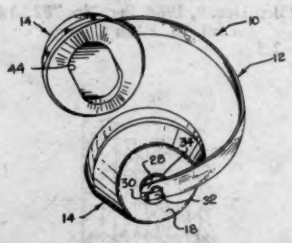


The cloth or fabric part of the necktie does not need to be tied and untied and it does not extend around the neck of the user but is attached, in knotted form, to the medial part of a frame member of thin flat material. The frame member has two oppositely extending wings arranged to be inserted between the neckband and collar of the shirt. At least one short hook shaped prong is rigid with and extends sidewise from the outer end portion of each wing member to engage with the upper neck portion of the shirt and hold the necktie in place.

3,562,816
ATTACHMENT MOUNTING MEANS FOR HEARING PROTECTOR EARCUPS

Lawrence C. Hutchinson, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass., a corporation of Delaware

Filed June 23, 1969, Ser. No. 835,440
Int. Cl. A41d 21/00
U.S. Cl. 2—209 5 Claims

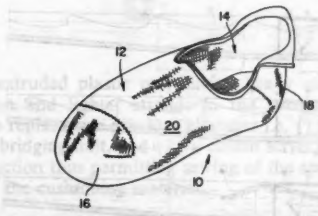


Hearing protector earcup supporting means including a headband having attachment means at each of its opposite ends for receiving and supporting an earcup. The attachment means in each case comprises a fork having two planar prongs betwen which a recessed end of an earcup mounting stud is fitted with an intermediate third prong of the fork extending over and latched to the end of the stud. The stud is either formed as an integral extension of the wall of its respective earcup or extended through the earcup wall in coaxially aligned relationship with the cup so as to permit rotation of the cup about its axis relative to the headband.

3,562,817
METHOD OF MAKING WAISTBANDS
Erie G. Huddleston, Monroe, Ga., assignor to Oxford Industries Inc., Atlanta, Ga., a corporation of Georgia
Filed Aug. 21, 1969, Ser. No. 851,986
Int. Cl. A41d 1/06
U.S. Cl. 2—236 11 Claims

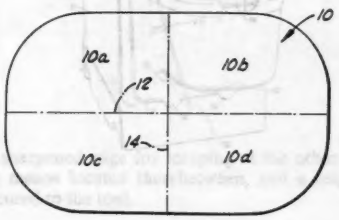
A method of making waistbands for pants and other garments wherein a series of waistband panels are joined together in end-to-end relationship to form a continuous series of waistband panels, the continuous series of waistband panels are moved through a predetermined path, a continuous band of facing material is fed into abutting relationship with one edge of the continuous series of waistband panels, and the facing material is continuously rocaped to the continuous series of waistband panels. The waistband panels are marked and belt loops are attached to the waistband panels in positions corresponding to the markings. Labels are attached to the facing material at positions corresponding to the ends of the waistband panels, the waistband panels are separated and the facing material is cut at positions adjacent the ends of the waistband panels alternately with a straight cut extending across the facing material and with a Y-shaped cut to remove a portion of the facing material.

3,562,818
FOOTSOCK
Clarence G. Burton, 3819 Fort Ave., Lynchburg, Va. 24502
Filed Jan. 24, 1969, Ser. No. 793,726
Int. Cl. A43b 3/10, 11/00
U.S. Cl. 2—239 4 Claims



There is disclosed a footsock which has a toe portion, a heel portion and a central body portion interconnecting the heel and toe portions. An opening is provided to the footsock to give access therein, which opening extends across the rearward part of the central body portion and the heel portion of the footsock. The heel portion of the footsock is formed with an upper extension adjacent the opening so that the opening is generally semicircular at its lower forward part and tapers upwardly and rearwardly therefrom. An elastic banding completely encircles the opening, and the upper extension of the heel portion is foldable over an underlying adjacent part of the heel portion so that the folded-over part with the banding supports the footsock in desired position.

3,562,819
POCKET PROTECTOR
Claura T. Crawford, 1215 W. Randolph, Enid, Okla. 73701
Filed Sept. 4, 1969, Ser. No. 855,332
Int. Cl. A41d 27/20
U.S. Cl. 2—248 6 Claims

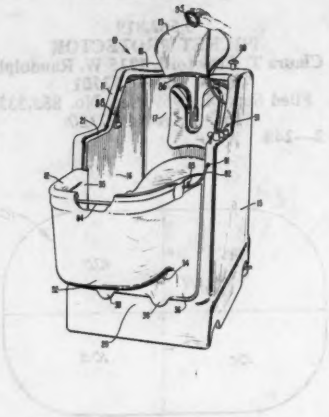


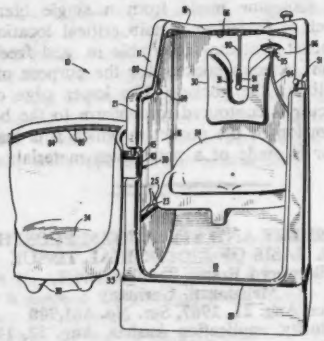
A pocket protector made from a single blank of material which is folded at certain critical locations to provide a pocket protector insertable in, and freely removable from, trousers pockets for the purpose of protecting and lining the pockets. The lower edge of the pocket protector is contoured to conform to the bottom and inside portion of the pocket in which it is inserted. The protector is made of a non-woven material.

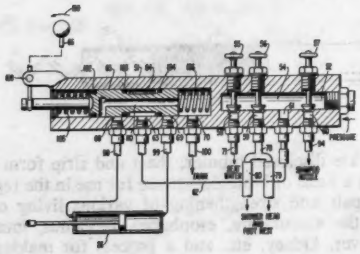
3,562,820
TUBULAR SHEET AND STRIP FORM PROSTHESES ON A BASIS OF BIOLOGICAL TISSUE
Bernhard Braun, Trankelucke 1, Melsungen, Germany
Filed Aug. 21, 1967, Ser. No. 661,900
Claims priority, application Austria, Aug. 22, 1966, A 7,958/66
Int. Cl. A61f 1/24
U.S. Cl. 3—1 5 Claims

There are disclosed tubular, sheet and strip form prostheses on a basis of biological tissue for use in the replacement, repair and strengthening of various living organs such as the vasculature, esophagus, bronchus, intestine, ureter, liver, kidney, etc. and a process for making and using the same. The prosthesis itself comprises a unitary structure of alternating layers of natural tissue and collagen fibres. The same is manufactured by applying a strip, sheet or tube of biological material onto a substantially rigid support, coating the exposed surface with a binder paste, as for example, a collagen fibre paste, or bringing about the swelling of the exposed surface, thereafter applying a second layer of natural material and repeating the procedure until the desired wall thickness is obtained. The multi-layer prosthesis is then dried and removed from the underlying support.

3,562,821
BATHING CABINET
Carl J. Queen, 5310 Peachtree-Dunwoody Road NE., Atlanta, Ga. 30305
Filed Mar. 24, 1969, Ser. No. 809,684
Int. Cl. A47k 3/08, 3/22
U.S. Cl. 4—146 10 Claims

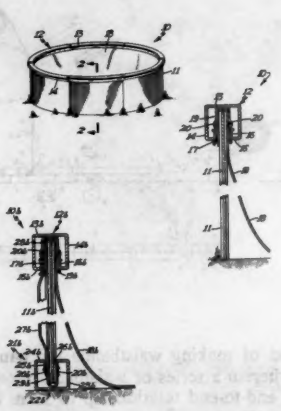






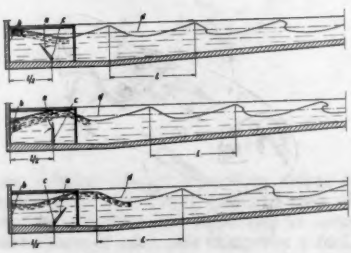
A bathing cabinet comprising a housing open at its top and front portions, with a door connectable to the housing to close its front portion. A seat is movable in a horizontal direction within the housing toward and away from the front portion under the influence of an hydraulic ram, and water flows through a valve system to the various sprays within the cabinet.

3,562,822
SWIMMING POOL WITH LOCK-ON RAILS
Arvel L. Wall, Helena, Ark., assignor to Doughboy Industries, Inc., New Richmond, Wis., a corporation of Wisconsin
Filed Mar. 7, 1969, Ser. No. 805,246
Int. Cl. E04h 3/16
U.S. Cl. 4—172.19 8 Claims



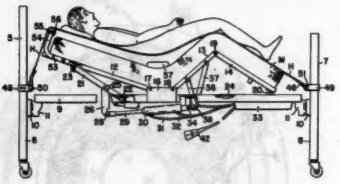
An above-ground pool includes a continuous closed side wall formed of metal and oriented in upright relation. An impervious flexible plastic liner is secured to the upper edge of the side wall by telescopic top rails. The side wall is provided with outwardly projecting protuberances which releasably engage the top rails with snap coupling effect to releasably interlock the side wall to the rails. Telescoping bottom rails may also be provided if desired and such bottom rails will also engage and interlock with protuberances on the side wall.

3,562,823
WAVE PRODUCING MACHINE, ESPECIALLY FOR SWIMMING POOLS
Friedrich Köster, Hamburger Strasse 88, 2240 Heide, Holstein, Germany
Filed July 9, 1968, Ser. No. 743,384
Claims priority, application Germany, Jan. 19, 1968, K 64,501
Int. Cl. E04h 3/18
U.S. Cl. 4—172.16 3 Claims



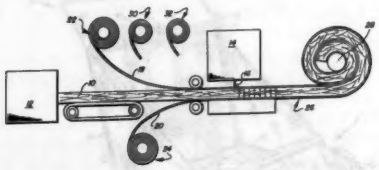
A swimming pool equipped with oscillating blade means for actuating the water in the pool, in which said blade means is completely below the water level when the water is at rest while actuating means arranged outside the swimming pool are drivingly connected to said blade means for pivoting the same back and forth.

3,562,824
HAMMOCK FOR INVALID BEDS
William Wayne White, 1100 S. Ocean Blvd., Pompano Beach, Fla. 33062
Filed Dec. 30, 1968, Ser. No. 787,750
Int. Cl. A61g 7/02, 7/10
U.S. Cl. 5—61 4 Claims



A sheet-like hammock for an invalid bed of the type wherein a flexible mattress is rested upon a jointed supporting frame therefor. This frame which is normally disposed horizontally is adapted to execute certain movements, together with the mattress thereon, whereby the head end of the mattress, also a jointed area toward its foot end, are raised. Two widely spaced suspension points are thereby provided for sustaining the hammock off of the mattress when the hammock ends are anchored to the head and foot units of the bed frame. The space below the hammock, when so raised, suffices for accommodation of a bed pan when rested upon the mattress. An opening in the hammock at a point opposite the bed pan permits the occupant of the bed to freely discharge his body wastes therethrough and into the pan.

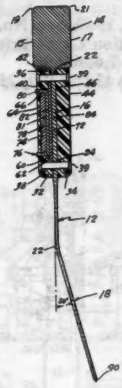
3,562,825
MATTRESS CONSTRUCTION AND PLASTIC NET SPRING BRIDGING ELEMENT FOR USE THEREIN
Ronald L. Larsen, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn., a corporation of Delaware
Filed Mar. 18, 1969, Ser. No. 808,231
Int. Cl. A47c 23/30
U.S. Cl. 5—354 4 Claims



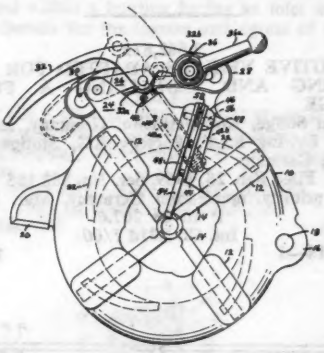
An extruded plastic net, having heavy strands in one direction and lighter strands in the other direction, is used to replace two previous elements i.e. (1) a wire-rope spring bridging unit, and (2) a cotton scrim in a mattress construction thus permitting sewing of the spring bridging unit to the cushioning material.

3,562,826
MULTIPURPOSE SCRAPING TOOL
James P. Vaughn, 3403 Connelly Lane, Chattanooga, Tenn. 37412
Filed Nov. 29, 1968, Ser. No. 779,800
Int. Cl. B26b 11/00
U.S. Cl. 7—14.1 1 Claim

A multipurpose scraping tool having a magnetic device secured thereto for removably attaching said tool to any magnetizable surface. The tool is especially useful to a housepainter in preparing a wall preliminary to painting, said tool comprising a handle, hammering means at one end, a sharpened edge for scraping at the other end, nail-pulling means located therebetween, and a magnetic device secured to the tool.

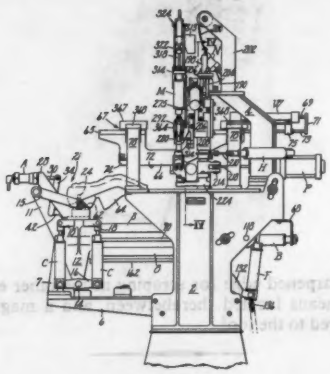


3,562,827
SELF-OPENING DIE HEAD
Anton J. Janik, North Ridgeville, Ohio, assignor to Emerson Electric Co., St. Louis, Mo., a corporation of Missouri
Filed June 27, 1968, Ser. No. 740,634
Int. Cl. B23g 5/10, 5/12
U.S. Cl. 10—99 4 Claims



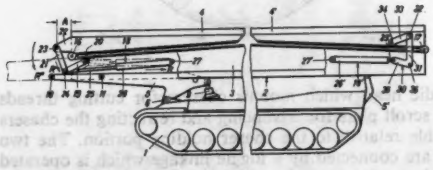
A die head which mounts chasers for cutting threads has a scroll plate for advancing and retracting the chasers movable relative to the chaser holding portion. The two parts are connected by a toggle linkage which is operated by a lever to cause the relative movement between the die head parts to retract and advance the chasers. A spring plunger is carried by one of the head parts disposed to engage the center joint of the toggle linkage and to move the loggle linkage to an open position to retract the chasers. Lock means for the plunger includes a guide means pivotally mounted on the one die head part and arranged for locking engagement with the plunger. A trigger slide in the guide means may be moved to a position to be engaged by a pipe being threaded and release the lock means. It may be slid to one side where it is not engaged by the pipe when a manual operation is desired.

3,562,828
AUTOMATIC LASTING MACHINES
Philip B. Gower, Skipton, and Jeremy C. Heal and Raymond Snape, Leicester, England, assignors to USM Corporation, Boston, Mass., a corporation of New Jersey
Filed Feb. 17, 1969, Ser. No. 799,856
Claims priority, application Great Britain, Feb. 16, 1968, 7,606/68
Int. Cl. A43d *21/00, 23/00*
U.S. Cl. 12—14.5 13 Claims



A shoe lasting machine having a support automatically orienting shoes with lasting devices which include grippers automatically located at opposite sides of each shoe and adapted to pull the upper predetermined amounts depending on whether the shoe is left or right.

3,562,829
AUTOMOTIVE VEHICLE ADAPTED FOR TRANSPORTING AND INSTALLING A FOLDING BRIDGE
Friedhelm Söffge, Kornwestheim, Germany, assignor to Firma Dr.-Ing h.c.F. Porsche KG, Stuttgart-Zuffenhausen, Germany
Filed Feb. 25, 1969, Ser. No. 802,105
Claims priority, application Germany, Mar. 1, 1968, P 16 80 207.6
Int. Cl. E01d *1/00*
U.S. Cl. 14—1 11 Claims

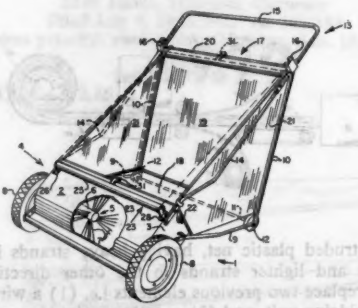


A powered vehicle including apparatus for transporting and installing a prefabricated folding bridge structure having a central bridge portion and folding access ramps, therein the bridge is supported on the vehicle upon a cantilever support pivotally mounted thereon. The control system for effecting pivoting of the access ramps from the folded position into the extended position includes a servo-mechanism of variable length pivotally connected to the central bridge portion and operatively connected with an access ramp through a linkage including at least one rotatable intermediate guide member.

3,562,830
GOLF BALL WASHER
Charles E. Ruedisueli, 15728 Bentler, Detroit, Mich. 48223
Filed Jan. 23, 1969, Ser. No. 793,262
Int. Cl. A63b *47/04*
U.S. Cl. 15—21 17 Claims

A golf ball washer adapted to be mounted on the wheel of a golf cart for rotation therewith. An annular chamber is defined in an enclosed housing for containing golf ball cleaning material and has a tangential spout for inserting and removing a golf ball.

3,562,831
WINDSCREEN ATTACHMENT FOR LAWN SWEEPERS
Bernard R. Kowalski, 2256 McEwan St., Saginaw, Mich. 48602
Filed Apr. 18, 1969, Ser. No. 817,320
Int. Cl. E01h *1/02*
U.S. Cl. 15—79 6 Claims



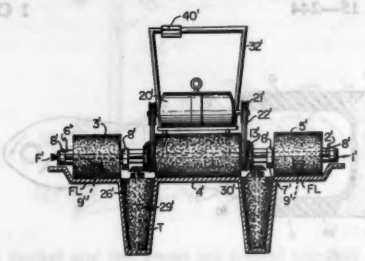
A lawn sweeper having a wheeled frame on which are supported a rotary sweeper unit and a container having an open side through which swept material may enter the container. A rolled sheet of flexible material is mounted on the frame and may be unrolled to occupy a position extended from the sweeper unit and overlying the open side of the container to provide a windscreen. The flexible sheet may be latched in overlying relation to the container, but may be restored automatically to its rolled condition.

3,562,832

MACHINE FOR CLEANING CONCRETE FORMS

Roger Rickard, Rte. 1, Middletown, Va. 22645

Filed May 7, 1969, Ser. No. 822,479
Int. Cl. A46b *13/02*
U.S. Cl. 15—56 10 Claims



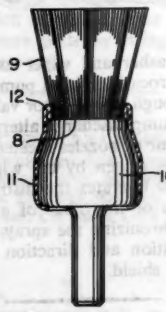
A machine for cleaning elongated concrete forms of the type that include laterally spaced horizontal surfaces and depending trough means and which machine includes a frame, and carried by the frame a plurality of horizontal rotary brush means for frictionally engaging the horizontal surfaces of the form, vertically disposed rotary brush means for engaging the walls of the trough means, vertically adjustable castor wheels, a drive means and power transmission means operably coupling the drive means with the horizontal and vertical rotary brush means for simultaneously rotating all the brush means to propel the machine along the form to remove dirt and concrete particles therefrom.

3,562,833

ROTARY BRUSH

Vernon K. Charvat, Bay Village, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio, a corporation of Ohio

Filed June 26, 1969, Ser. No. 836,908
Int. Cl. A46b *13/02*
U.S. Cl. 15—180 25 Claims



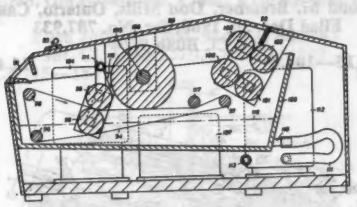
A power-driven rotary brush having a collar of plastic sheet material encircling the holder portion of the brush and extending a short distance beyond such holder about the brush material where such brush material emerges from the holder. The plastic collar is folded in the region of the brush material to present a folded edge thereto as well as to increase the thickness of the collar in such region.

3,562,834

DEVICE FOR PROCESSING SHEET COPYING MATERIAL

Emile Frans Stievenart, Antwerp, and Marcel Nicolas Vrancken, Hove, Belgium, assignors to Gevaert Agfa N.V., Mortsel, Belgium, a Belgian company

Filed Nov. 30, 1967, Ser. No. 686,882
Claims priority, application Great Britain, June 2, 1967, 25,646/67
Int. Cl. G03d *5/06*
U.S. Cl. 15—100 8 Claims



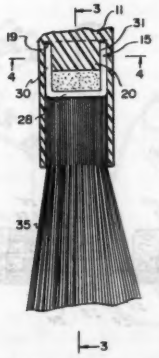
Apparatus for developuing sheet material carrying a recording layer which is irreversibly imagewise differentiated in terms of solvent solubility in which the sheet material is applied to a wetted endless belt and is delivered thereby into frictional rubbing contact with a rotatable rubbing drum having a resilient porous peripheral surface. The rubbing drum is wetted with the solvent while making contact with the sheet material, and the peripheral speed of the drum is preferably substantially higher, say at least ten times higher, than the transport speed of the sheet material on the belt. Surplus solvent can be caught between a tray arranged beneath the rubbing drum and through which the lower stretch of the endless belt passes. All of the operative components can be arranged within a housing having an inlet and outlet openings therein for the ingress and egress of the sheet material.

3,562,835

STAPLE GUIDE FOR BRUSH HANDLE

John G. Baumgartner, Plano, Ill., assignor to Anchor Brush Company, Montgomery, Ill., a corporation of Delaware

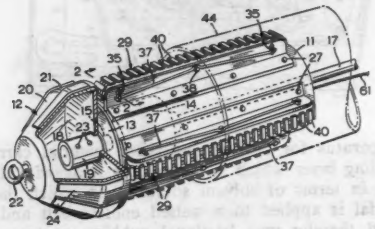
Filed July 2, 1969, Ser. No. 838,554
Int. Cl. A46b *3/16*; A46d *3/00*
U.S. Cl. 15—195 6 Claims



A brush includes a handle having a circular socket in one end for receiving the brush bristles. A solid cylindrical portion integral with the handle extends into the

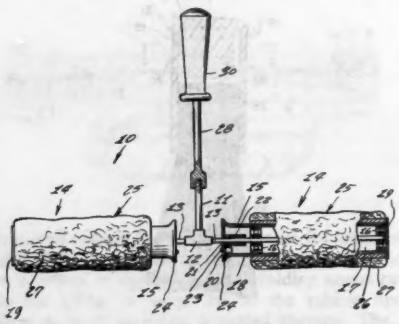
socket, and the walls of the cylinder and the socket define a circular channel having a depth equal to the height of the solid cylinder. A staple is inserted in the socket and the body of the staple captures the brush bristles to the top surface of the cylinder. The staple legs are wedged into the circular channel to secure the staple to the handle.

3,562,836
REAMING TOOL
James McGhee Frew, Weston, and Raymond Muir Bremner, Don Mills, Ontario, Canada, assignors to Raymond M. Bremner, Don Mills, Ontario, Canada
Filed Dec. 30, 1968, Ser. No. 787,933
Int. Cl. B08b *9/04*
U.S. Cl. 15—104.3 11 Claims



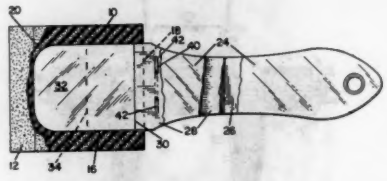
A reaming tool for reaming the internal surface of a pipe comprises a rotary reaming head mounted at one end of a cylindrical housing in which a motor for driving the reaming head is mounted. A plurality of endless tracks mounted externally of the housing and extending along the sides thereof are provided with friction pads, which engage the inner surface of the pipe to prevent rotation of the housing within the pipe. The reaming tool is drawn through the pipe by means of a tow cable connected to a swivel coupling mounted on the reaming head.

3,562,837
PAINT ROLLER
Stanley W. Baginski and Stanley W. Baginski, Jr., both of 189 E. 18th St., Brooklyn, N.Y. 11226
Filed Nov. 25, 1968, Ser. No. 778,654
Int. Cl. B05c *1/08*
U.S. Cl. 15—230.11 2 Claims



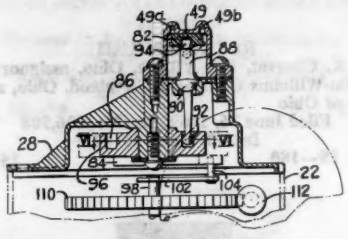
A paint roller assembly comprised of a pair of paint rollers carried upon ball bearings supported on a shaft, and the ball bearings being enclosed within an oil reservoir that is designed to be leakproof regardless of the position of the paint roller assembly.

3,562,838
DISPOSABLE PAINT APPLICATOR
Russell A. Burton, Southbridge, and John I. Maxim, Leominster, Mass., assignors to Hyde Manufacturing Company, Southbridge, Mass., a corporation of Massachusetts
Filed Jan. 23, 1969, Ser. No. 793,327
Int. Cl. A46b *15/00*
U.S. Cl. 15—244 2 Claims



Disposable paint applicator comprising a laminated cardboard handle, a thin flexible plastic tang adhesively secured thereto, the tang and a portion of the handle being embedded and adhesively secured to a block of foamed cellular plastic material having a beveled free edge for the application of paint.

3,562,839
WINDSHIELD CLEANING APPARATUS FOR MOTOR VEHICLES
William C. Riester, Williamsville, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.
Filed July 12, 1968, Ser. No. 753,015
Int. Cl. B60s *1/48*
U.S. Cl. 15—250.02 5 Claims

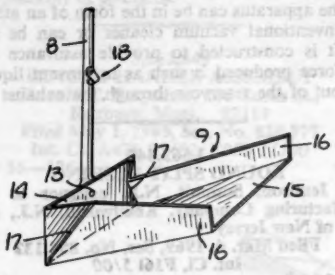


A windshield washer and wiper assembly includes a cam actuated reciprocating piston pump which discharges washer solvent through a distributor valve. The distributor valve directs the pump discharge alternately through one or the other of a pair of nozzles located on the windshield wiper arms. A cam driven by the wiper motor actuates the pump, and also operates the distributor valve to alternately open one or the other of a pair of discharge ports thereby synchronizing the spray of the washer solvent with the position and direction of motion of the wiper arms on the shield.

3,562,840
COLLAPSIBLE DUST PAN
Albert B. Meszaros, 24 Eastern Ave., Ossining, N.Y. 10562
Filed Jan. 27, 1969, Ser. No. 794,317
Int. Cl. A47l *13/52*
U.S. Cl. 15—257.4 12 Claims

The dust pan is constructed with a back wall secured to a handle and an apron which is pivotal with respect to the back wall so as to pivot into a locked storage position against the handle. In one embodiment, the side

walls of the bucket are creased so as to fold inwardly on themselves upon pivoting of the apron into the collapsed condition. In another embodiment, the side walls



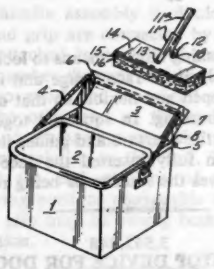
of the bucket and the apron are hinged together so as to permit pivoting of the side walls against the apron when the apron is pivoted into the collapsed condition.

3,562,841

MOP AND WRINGING BUCKET COMBINATION

Galen E. Royalty, 1222 Cresthaven Drive, Silver Spring, Md. 20903

Filed Dec. 20, 1968, Ser. No. 785,287
Int. Cl. A47l *13/58*
U.S. Cl. 15—260 **2 Claims**



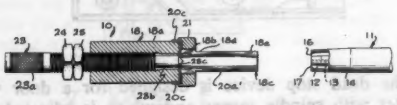
A mop of the sponge-type material and a bucket provided with a squeeze plate for squeezing the mop. The mop and squeeze plate have a cooperating hook-type coupling about which the mop can be pivoted to squeeze it against the pressure plate by swinging the handle on the mop in an arcuate path.

3,562,842

WELDING TIP CLEANING DEVICE

Iven E. Turnipseed, Los Angeles, Calif. (10633 Mount Gleason Ave., Sunland, Calif. 91040)

Filed Jan. 29, 1969, Ser. No. 795,017
Int. Cl. B08b *1/04*
U.S. Cl. 15—104.09 **11 Claims**



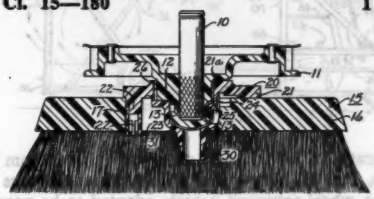
A device for cleaning a welding tip of the type used for gas metal arc welding. The device comprises a tubular shaft adapted for mating engagement about the welding tip guide tube. A pair of blade members are diagonally oppositely disposed along the exterior of the shaft, sufficiently close thereto to permit insertion through the gas nozzle opening of the welding tip to be cleaned. An actuator means spreads the blades away from the shaft and against the inner surface of the welding tip gas nozzle so that relative rotation of the cleaning device and the nozzle causes the blades to scrape undesired residue from the interior of the welding tip.

3,562,843

HUB FOR A ROTARY BRUSH

Michael E. Belicka, Greenwich, and John J. Kowalewski, Riverside, Conn., assignors to Consolidated Foods Corporation, Old Greenwich, Conn., a corporation of Maryland

Filed July 11, 1969, Ser. No. 840,963
Int. Cl. A46b *13/02*; A47l *11/282*
U.S. Cl. 15—180 **1 Claim**



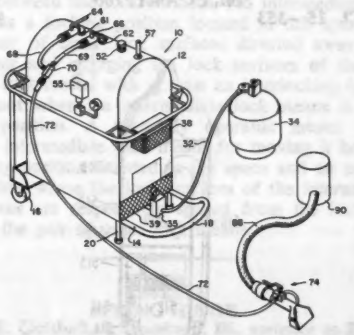
A hub for a rotary, floor scrubbing brush by which the brush is removably attached to the driving spindle of a floor polisher. The hub is connected to the brush back by means of pins which pass through openings in the brush back and the free ends of the pins are deformed or expanded in order to contact the hub at the opposite side of the brush back. In addition, the hub is provided with a central cylindrical projection onto which a buffing pad may be removably attached to the brush. The brush hub according to this invention is also capable of being molded as a single piece for economic manufacture and assembly.

3,562,844

PORTABLE RUG DYEING MACHINE

John A. Thompson, Portland, Oreg., and William H. Wisdom, Portland, Oreg. (Rte. 2, Box 178E, Sherwood, Oreg. 97140); said Thompson assignor to said Wisdom

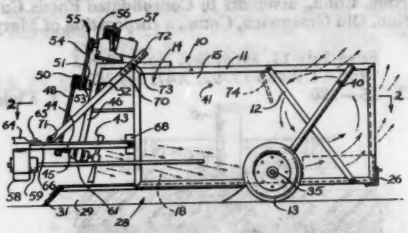
Continuation of application Ser. No. 723,325, Mar. 29, 1968, which is a continuation of application Ser. No. 344,085, Feb. 11, 1964. This application Nov. 10, 1969, Ser. No. 871,654
Int. Cl. A47l *11/34*
U.S. Cl. 15—302 **4 Claims**



Applicator for spraying dye and/or cleaning solution into rug and upholstery fabric and subjecting fabric to a vacuum, particularly for use with portable apparatus. Head portion with open bottom nozzle in contact with the fabric, a vacuum chamber and a spray chamber in

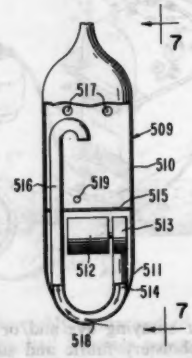
the head and nozzles directing spray into the fabric. Means to connect with vacuum source and source of solution under pressure.

3,562,845
LITTER REMOVAL APPARATUS
Fred C. Hayden, 7785 Yorkshire Drive, Reno, Nev. 89503
Filed Sept. 16, 1968, Ser. No. 762,228
Int. Cl. E01h 1/08
U.S. Cl. 15—347 **7 Claims**



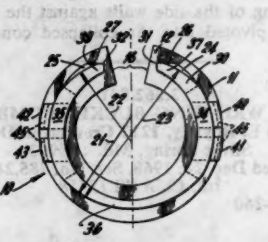
Apparatus for and method of removing litter from parking lots, streets and similar areas. The apparatus constitutes a wheel-equipped vehicle adapted to be propelled along the surface of such area, and includes a frame having a casing mounted thereon which defines a relatively large enclosure therewithin. Accumulator structure in the form of two forwardly diverging collector members sweeps along such surface as the apparatus traverses the same and directs litter toward a restricted location at the vertex of the members. A blower at the forward end of the apparatus moves a stream of air toward such restricted location to pick up and carry litter accumulated thereat into the enclosure from which the air escapes through screened outlets that retain the litter within the enclosure. The method includes the steps of accumulating litter from a relatively compact surface into a restricted location therealong, providing an air stream and directing the same toward such location to carry litter thereat toward a receptacle, passing the litter-carrying air through the receptable, and within the receptacle extracting litter from the air passing therethrough.

3,562,846
APPARATUS FOR COLLECTING SURFACE LIQUIDS
Marven Creamer and Adelene B. Creamer, both of 137 Palmer Ave., Mountain View, Calif. 94040
Filed Apr. 29, 1969, Ser. No. 820,175
Int. Cl. A46l 7/00
U.S. Cl. 15—353 **5 Claims**



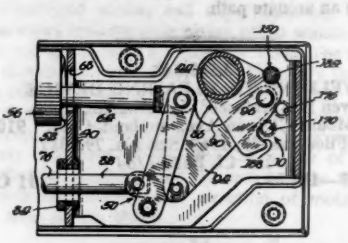
Apparatus for drawing liquid by suction from a surface and into a reservoir including intake and exhaust conduits communicating with the reservoir. The intake conduit has an inner end which is shaped to provide a continuous change in the path of flow of the liquid flowing therethrough to thereby avoid impact of the liquid with adjacent structure and thereby minimize aeration of the liquid. The apparatus can be in the form of an attachment for a conventional vacuum cleaner or can be self-contained. It is constructed to provide assurance that the suction force produced is such as to prevent liquid from passing out of the reservoir through the exhaust conduit.

3,562,847
ROUND SPLIT BUSHING
William Jemison, Summit, N.J., assignor to Heyman Manufacturing Company, Kenilworth, N.J., a corporation of New Jersey
Filed Mar. 4, 1969, Ser. No. 804,132
Int. Cl. F16l 5/00
U.S. Cl. 16—2 **21 Claims**



A round split bushing having means to lock it in a round aperture in a panel, has a face flange and integral shank normally gapped open and flexible so that a wire may be inserted into the bushing. In squeezed together position the shank matches the aperture and guides itself into locking position. When fully inserted the face flange while not truly round gives the illusion of being round.

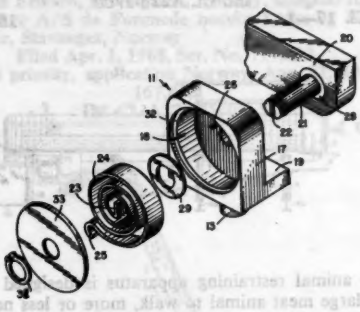
3,562,848
DEAD STOP DEVICE FOR DOORS
William A. Czapar, Niles, Ill., assignor Rixson Inc., Franklin Park, Ill., a corporation of Illinois
Filed Sept. 30, 1968, Ser. No. 775,569
Int. Cl. E05f 3/20
U.S. Cl. 16—55 **9 Claims**



The dead stop device is designed for a door which rotates with spindle means and which is adjusted to be operatively associated with a door control device such as a door closing mechanism which tends to return the door to a preselected position. Crank means rotatable with the spindle means has at least one abutment surface and also constitutes a part of the door closing mechanism. The abutment surface is adapted to abut against stop means in order that the movement of the door may be

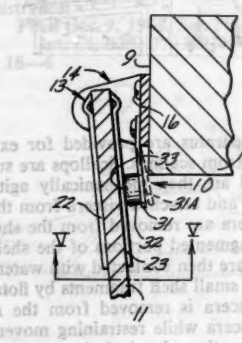
stopped. The spindle means and the stop means are supported such that the stop means may be selectively positioned in any one of a plurality of positions in order that the door may be stopped in its movement at any selected one of a plurality of positions.

3,562,849
HINGED HANDLE ASSEMBLY
Donald C. Brayshaw, 206 Eustis St., Roxbury, Mass. 02119
Filed May 1, 1969, Ser. No. 820,977
Int. Cl. A47b 95/02; E05b 1/100
U.S. Cl. 16—126 9 Claims



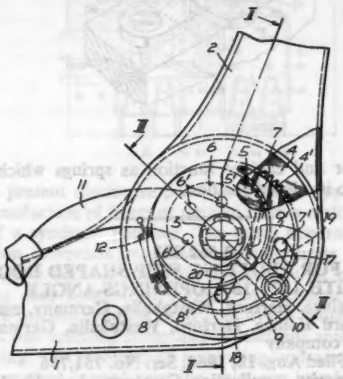
A hinged handle assembly is disclosed in which the ends of a hand grip are connected by pivots to uprights on supports attached to a wall of an object. Each upright has a chamber through which the connecting pivot extends and to which the inner end of a coil spring is connected. The other end of the spring is attached to the upright and the springs urge the grip into an inoperative position relative to the wall. The upright has a shoulder and the end portions of the grip and the shoulders having portions engageable to limit the extent to which the grip may be swung both with and against the spring action.

3,562,850
MAGNETIC DOOR HOLDER
Carlyle R. Eliason, Kalamazoo, and Charles H. Naas, Portage, Mich., assignors to Eliason Refrigerator Company, Kalamazoo, Mich., a corporation of Michigan
Filed Aug. 13, 1968, Ser. No. 752,282
Int. Cl. A47g 27/04; E05c 17/56
U.S. Cl. 16—139 7 Claims



A magnetic device is mounted upon a wall structure closely adjacent a hinge mechanism for a swingable door having thereon a hinge element capable of magnetic attraction and engageable with the magnetic device for releasably holding the door in an open position.

3,562,851
DEVICE FOR RELEASABLY LOCKING AT A SELECTED POSITION COMPONENTS WHICH ARE MOVABLE ONE WITH RESPECT TO THE OTHER
Norbert Köller, Oschelbronn, Germany, assignor to Recaro AG, Glarus, Switzerland, a firm
Filed Sept. 16, 1968, Ser. No. 759,904
Claims priority, application Germany, Sept. 16, 1967, P 16 80 261.2
Int. Cl. E05d 11/08
U.S. Cl. 16—140 18 Claims

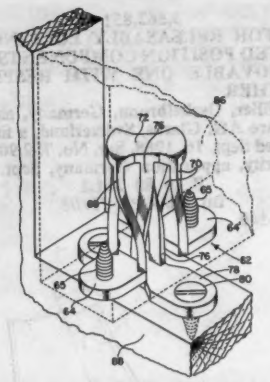


A device for releasably fixing, at a selected position relative to each other, a pair of components which are movable one with respect to the other, such as the back rest of an automobile seat with respect to the seat portion thereof. A pair of outer lock means are respectively connected with the components so that one of the outer lock means is movable relative to the others, and this pair of outer lock means respectively has a pair of lock surfaces directed toward each other. A guide means coacts with the pair of lock means to guide the one lock means for movement relative to the other along a path which does not change the configuration of a space which is defined between the lock surfaces. An intermediate lock means has a locking position located in this space and has a pair of outer lock surfaces directed away from each other and engaging the lock surfaces of the pair of outer lock means with at least an interlocking type of engagement when the intermediate lock means is in its locking position. A manually operable means coacts with the intermediate lock means for moving it between its locking position situated in the space and an unlocking position where the lock surfaces of the intermediate lock means are respectively spaced from the lock surfaces of the pair of outer lock means.

3,562,852
SPRING HINGE
Charles E. Gutshall, Schaumburg, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill., a corporation of Delaware
Filed Nov. 29, 1968, Ser. No. 779,712
Int. Cl. E05d 9/00
U.S. Cl. 16—150 3 Claims

Hinge device adapted to be mounted in a recess in a cabinet door is formed in a single piece of material—

preferably molded plastic. Resilient portions of the device which interconnect relatively movable portions fastened



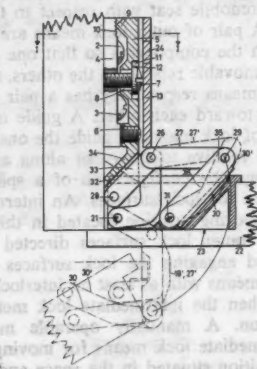
to the door and cabinet function as springs which urge the hinge to its closed position.

3,562,853

HINGE FOR ABUTTING STEP-SHAPED DOORS WITH 150°–180° OPENINGS-ANGLE

Richard Heinze, Herford, Westphalia, Germany, assignor to Richard Heinze, Herford, Westphalia, Germany, a German company

Filed Aug. 12, 1968, Ser. No. 751,796
Claims priority, application Germany, Apr. 19, 1968, P 17 59 303.2
Int. Cl. E05d *3/06*
U.S. Cl. 16—163 **4 Claims**



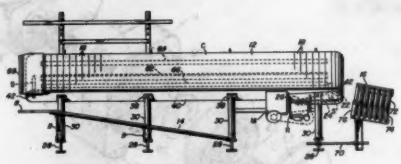
The new hinge comprises a base plate separately attached to an inner wall of a piece of furniture and non-rotatably embraced by a shoelike bracket which bracket is adjustable in length-direction as well as in direction to and from the wall and furthermore itself smoothly embraced by a link which with one end is horizontally guided in a length-guiding of the bracket parallel to the furniture wall and with the other end pivoted in and near the bottom of a housing inserted in that part of the fluted or step-shaped door which in closed state protrudes into the inner of the furniture. The bracket with its point also extends into said housing when the door is closed, an obtuse-angled link with one end being pivoted to said bracket point and with the other end pivoted to one end of a further link which with its other end is pivoted to another pivot in and near the bottom of said housing, while an intermediate point of the obtuse-angled link is pivoted to an intermediate point of said guided shoelike link, said housing being sidely open in direction to hinge-corner.

3,562,854

ANIMAL RESTRAINING APPARATUS

Carl Oscar Schmidt, Jr., Cincinnati, Ohio, assignor to The Cincinnati Butchers' Supply Company, Cincinnati, Ohio, a corporation of Ohio

Filed Dec. 30, 1968, Ser. No. 787,734
Int. Cl. A22b *1/00*
U.S. Cl. 17—1 **18 Claims**



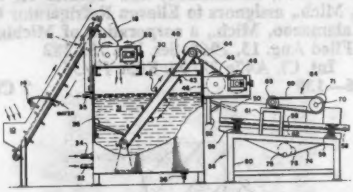
The animal restraining apparatus is designed to permit a large meat animal to walk, more or less normally, toward the stunning or sticking station of an abbatoir; in the course of travel, the floor gradually leaves the hoofs, and moving conveyors at opposite sides of the animal gently assume support of the entire weight of the animal at the belly, while at the same time confining and immobilizing the four legs, so that the animal is brought without delay or extra effort, into perfect position for stunning or sticking.

3,562,855

SCALLOP PROCESSING

Elmer Dryden Willis, Williston, N.C., assignor to Willis Bros., Inc., Williston, N.C., a corporation of North Carolina

Filed May 27, 1968, Ser. No. 732,247
Int. Cl. A22c *29/00*
U.S. Cl. 17—48 **6 Claims**



A method and apparatus are provided for extracting the adductor muscle from scallops. Scallops are subjected to a heat shock and are then mechanically agitated to disengage the muscle and attached viscera from the shell. The muscle and viscera are removed from the shells and separated from unfragmented portions of the shells on a vibrating screen and are then contacted with water before being separated from small shell fragments by flotation in a brine solution. Viscera is removed from the muscles by pulling on the viscera while restraining movement of the muscles. The invention also includes a method and apparatus for removing viscera from the adductor muscle of shucked scallops. Scallop muscles and attached viscera are placed on the upper surface of an inclined path

formed by a plurality of rollers. Viscera is pulled from the scallop muscle and through the nip formed by adjacent rollers by rotating the upper portion of adjacent rollers towards each other. Detached viscera is cleaned from the rolls below the inclined path. Advance of scallop muscles down the path is controlled by intermittently rotating the upper portion of adjacent rollers away from each other to permit the lower of the adjacent rollers to advance the muscle down the path and by spraying a flow of fluid on at least some of the muscles on the path to affect their rate of movement down the path.

3,562,856
MAGAZINE TUBE FOR FISH

Jan Bergh Eriksen, Bronngaten, Norway, assignor to Trio Fabrikker A/S de Forenede norske Laase-og Beslagfabriker, Stavanger, Norway

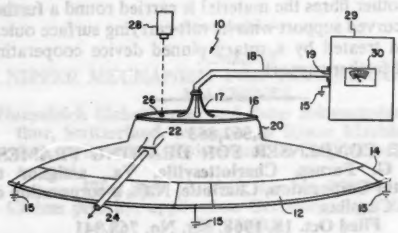
Filed Apr. 1, 1968, Ser. No. 717,593
Claims priority, application Norway, Apr. 21, 1967, 167,835
Int. Cl. A22c *25/08*
U.S. Cl. 17—55 **1 Claim**

Magazine tube for fish for use in connection with fish processing machinery in which the tube has an oval cross-section and to which a reciprocating motion is imparted, wherein the tube is slightly conical expanding from the input end towards the output end.

3,562,857
DIELECTRIC MOLDING APPARATUS

Charles B. King, Hampton, Robert T. Swann, Newport News, and Martin J. Menges, Seaford, Va., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 9, 1968, Ser. No. 766,244
Int. Cl. B29c *1/12*; H05b *1/00*
U.S. Cl. 18—6 **21 Claims**

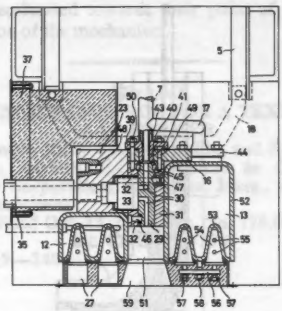


An apparatus for the dielectric heating, fusing and hardening of an organic matrix to form plastic materials into a useful, shaped product.

3,562,858
APPARATUS FOR THE MANUFACTURE OF SYNTHETIC FIBERS

Karl Lehner, Frankfurt, Germany, assignor to Vickers-Zimmer Aktiengesellschaft Planung und Bau von Industrieanlagen, Frankfurt am Main, Germany

Filed Nov. 1, 1967, Ser. No. 679,699
Claims priority, application Germany, Nov. 3, 1966, V 32,254
Int. Cl. D01d *3/00*
U.S. Cl. 18—8 **6 Claims**

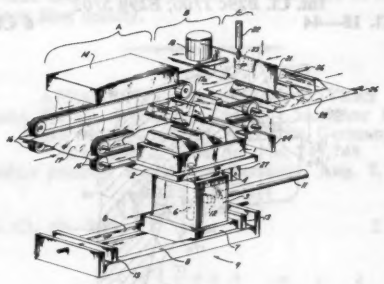


The present disclosure provides a novel apparatus for the manufacture of fibers or the like from a melt or a solution of a synthetic polymer. The novel apparatus of the invention comprises pre-formed spinning units which are jointable to form a complete structural unit capable of forming said fibers from a melt of synthetic polymer. The pre-formed spinning units comprise a spinning block, at least one spinning pump and at least one spinning nozzle casing. The elements of a spinning unit are joined together so that several spinning units can be combined in the manner of building blocks.

3,562,859
VACUUM FORMING APPARATUS

Journal E. McIntyre, Uniondale, N.Y., assignor to Auto-Vac Company, Inc., Tabor City, N.C., a corporation of North Carolina

Filed Mar. 12, 1968, Ser. No. 712,477
Int. Cl. B29c *3/02*
U.S. Cl. 18—19 **9 Claims**



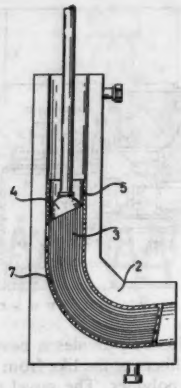
Improved apparatus with rapid cycle times is provided for the continuous production of articles by thermoforming techniques. Processes and apparatus savings are achieved by securing the forming die to a table that is mounted for reciprocation in both a vertical and horizontal plane so that the die and the formed article may be moved together from the heating to the cooling station. This enables feed stock to be heated at the same time a formed article is being cooled, and cycle times are greatly reduced.

3,562,860

DEVICE FOR MAKING PIPE BENDS OF THERMOPLASTIC MATERIAL

Emil Rottner and Franz Bock, Hofheim, Taunus, Willi Muth, Frankfurt am Main, and Günter Wenzel, Kelkheim, Taunus, Germany (all % Farbwerke Hoechst AG., Frankfurt am Main, Germany)

Filed Nov. 13, 1968, Ser. No. 775,443
Claims priority, application Germany, Nov. 29, 1967, P 17 04 661.6
Int. Cl. B29c *17/00*
U.S. Cl. 18—19 4 Claims



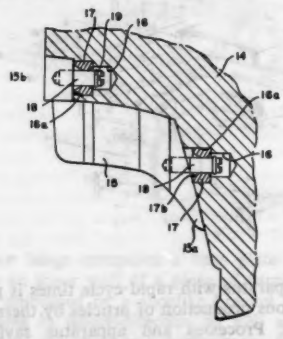
Pipe bends of thermoplastic material are manufactured by thermoforming by shoving a sleeve-shaped pipe section which is closed at one end into a pipe bend mould which is symmetrically split in the longitudinal direction. The introduction is carried out with the help of a flexible core which is several times split longitudinally and which is pressed against the bottom of the pipe section. After cooling, the mould is opened and the core or its individual parts are pulled out of the pipe bend and the ends of the latter are trimmed.

3,562,861

TIRE MOLD WITH REMOVABLE INSERTS

Leonard C. Youngblood, Grosse Pointe Park, Mich., assignor to Uniroyal, Inc., New York, N.Y., a corporation of New Jersey

Filed Jan. 14, 1969, Ser. No. 790,936
Int. Cl. B29c *1/00*; B29h *5/02*
U.S. Cl. 18—44 6 Claims



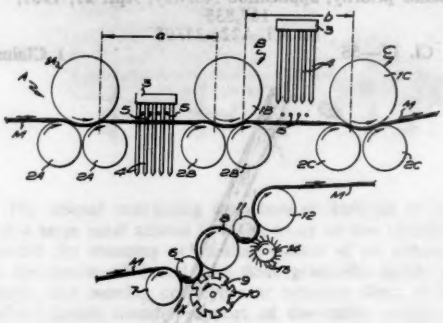
A tire mold with releasably mounted inserts such as tread lug-forming design elements is disclosed, for use in the manufacture of large size tires which are characterized by the presence of deep, multiple angle cross lug grooves and thus are difficult to remove from the mold. The inserts are provided with parallel projecting split ring-collared pins adapted to be snapped into and out of suitable retainer bushings fixed in the mold. When the press is opened at the end of a cure cycle for ejection of the tire from the mold, the mounting pins are pulled out of the bushings while the inserts remain attached to the tire, from which they can later, preparatory to reuse, be individually extracted without tearing or otherwise damaging the lugs.

3,562,862

METHOD AND MEANS FOR REMOVING IMPURITIES FROM A CONTINUOUS WEB OF TEXTILE FIBRES

Donald Walker, 58 Bramley Lane, Lightcliffe, near Halifax, England, and Michael John Walker, 36 Florence Ave., Wilsden, near Bradford, England

Filed Feb. 17, 1969, Ser. No. 799,833
Int. Cl. D01b *3/00*
U.S. Cl. 19—84 11 Claims



Vegetable and other undesirable matter (e.g., burr, seed and shive in the case of wool) is removed from a continuous web of parallelised textile fibres by the steps of (a) feeding the said web material continuously through a dabbing zone in which the material is nipped at two positions, (b) subjecting the moving material between said two positions to a rapid dabbing operation by which a series of closely spaced pins penetrate the material sufficiently to push said burrs or other larger impurities to one surface thereof, then (c) feeding the material to a stripping zone in which it is carried round a sharply curved support with the inpurity-carrying surface outermost so as to cause said impurities to project from said surface, and (d) removing the burrs or other large impurities by a stripping action taking place close to said surface and in a plane substantially tangential to the path of the material. Preferably, the distance between said two nipping positions is no greater than the mean fibre length of the material, said nips are provided by two sets of three rollers each and said stripping is done by rotary beater having longitudinal flutes cooperating with said support. To remove double cuts or tufts from wool or other fibres the material is carried round a further sharply curved support with its tuft-carrying surface outermost and treated by a rotary pinned device cooperating with said further support.

3,562,863

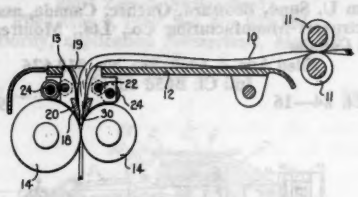
SLIVER CONDENSER FOR DRAWING FRAMES

Gaston G. Fornes, Charlottesville, Va., assignor to Cometsa Corporation, Charlotte, N.C., a corporation of North Carolina

Filed Oct. 18, 1968, Ser. No. 768,841
Int. Cl. D01h *5/72*
U.S. Cl. 19—150 2 Claims

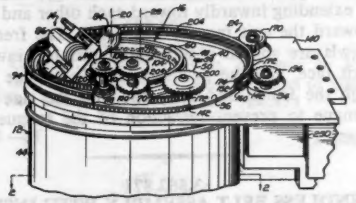
A sliver compressor in the form of a trumpet having an insert encased in a lower portion constructed of material having a high wear resistance to sliver passing

therethrough. The main body of said trumpet is constructed of material capable of dissipating heat readily.



The trumpet is supported on bearings which ride on the calender rolls for minimizing wear due to the frictional contact therewith.

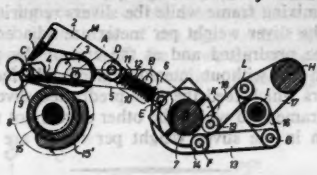
3,562,864
COILER ASSEMBLY
John H. Osgood, Chagrin Falls, and Steven W. Kundrach, South Euclid, Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio, a corporation of Ohio
Filed Oct. 8, 1968, Ser. No. 765,853
Int. Cl. B65h *54/80*
U.S. Cl. 19—159 25 Claims



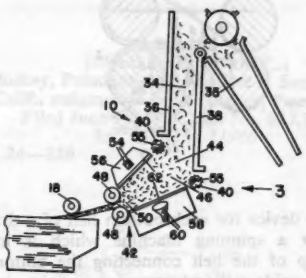
An improved coiler assembly for coiling sliver in a stationary container includes a coiler head which is simultaneously rotated by a first drive train about an axis which is offset from a central axis of the container and by a second drive train about the central axis of the container. Rotation of the coiler head about the first axis results in the formation of a coil of sliver in the container while rotation about the central axis of the container displaces loops of the coil of sliver relative to each other. An eccentric is provided for adjusting the position of the coiler head relative to the central axis of the container to enable sliver of different thicknesses to be coiled in the same relationship with a wall of the container. A transmission means for connecting the drive trains to a source of power includes a plurality of pairs of gears so that the gear ratio of the transmission means and the rate at which the coiler head is rotated around the central axis of the container can be adjusted to vary the extent to which the loops of sliver are displaced relative to each other.

3,562,865
NIPPER MECHANISM FOR TEXTILE COMBING MACHINES
Hansulrich Eichenberger and Peter Schwengeler, Winterthur, Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland, a corporation of Switzerland
Filed Sept. 12, 1968, Ser. No. 759,347
Claims priority, application Germany, Sept. 27, 1967, M 75,683
Int. Cl. D01g *19/16*
U.S. Cl. 19—227 5 Claims

The top nipper is pivotally mounted on the bottom nipper and is closed on the bottom nipper by the action of a spring loaded rocker arm. The rocker arm is pivoted at its two ends so that the forward pivot point on the top nipper describes a closure curve by which the nippers are decelerated towards their point of closure during operation of the mechanism.

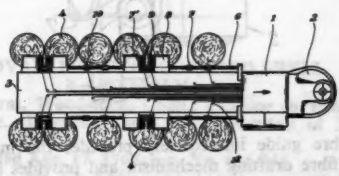


3,562,866
DENSITY CONTROL FOR A TEXTILE LAP FORMER
James Houston Roberson, Greenville, and Robert Joseph Poterala, Taylors, S.C., assignors to Crompton & Knowles Corporation, Worcester, Mass., a corporation of Massachusetts
Filed Oct. 23, 1968, Ser. No. 770,010
Int. Cl. D01h *5/38*
U.S. Cl. 19—240 7 Claims



A lap forming apparatus in which loose fibers are stuffed into an enclosure by stuffing rolls which are driven by a variable speed motor. The fibers are drawn from the other end of the enclosure and formed into a lap. Uniformity of the lap is controlled by measuring the average density of the fibers in the enclosure by photoelectric means. Variations in fiber density produce a signal to control the variable speed motor and thus vary the rate at which fibers are stuffed into the enclosure to maintain uniform fiber density.

3,562,867
APPARATUS FOR MIXING SLIVERS
Johann Kaiser, Waldshut, Germany, assignor to Chr. Mann Maschinenfabrik, Waldshut, Germany
Filed Aug. 2, 1968, Ser. No. 749,748
Claims priority, application Germany, Aug. 8, 1967, P 16 85 572.4
Int. Cl. D01h
U.S. Cl. 19—243 2 Claims



A method of and mixing frame for mixing slivers which do not require a reduction in the sliver weight per meter with slivers which require a reduction in the sliver weight

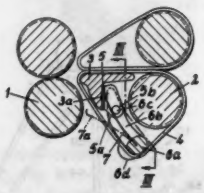
per meter, according to which the slivers not requiring a reduction in the sliver weight per meter are fed directly into the mixing frame while the slivers requiring a reduction in the sliver weight per meter are adjacent the mixing frame predrafted and at the end of the predrafting operation are without interruption directly fed to entering rollers which feed the thus predrafted slivers into the mixing frame into which the other slivers not requiring a reduction in the sliver weight per meter are being fed.

3,562,868

TIGHTENING DEVICE FOR BOTTOM BELTS OF DRAWING MECHANISMS FOR SPINNING MACHINES

Fritz Stahlecker, Bad Ueberkingen, and Sigmund Kemmler, Geislingen, Steige, Germany, assignors to Spindelfabrik Suessen, Schurr, Stahlecker & Grill G.m.b.H., Suessen, Germany

Filed June 26, 1968, Ser. No. 740,215
Claims priority, application Germany, July 20, 1967, S 110,912
Int. Cl. D01h *5/86*
U.S. Cl. 19—250 **17 Claims**



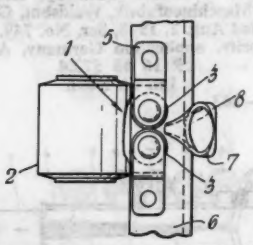
A tightening device for each bottom belt of a drawing mechanism for a spinning machine which is located within the loop of the belt connecting the bottom-belt roller with the guide rail and comprises a tightening bar which is pivotably mounted on the guide rail and presses under the action of at least one spring against the inner side of the belt.

3,562,869

TEXTILE FIBRE DRAFTING MECHANISMS

Joseph Noguera, London, England, assignor to Casablancas Limited, Manchester, England, a British company

Filed Aug. 2, 1968, Ser. No. 749,789
Claims priority, application Great Britain, Aug. 3, 1967, 35,671/67
Int. Cl. D01h *5/72*
U.S. Cl. 19—288 **11 Claims**



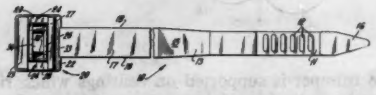
A fibre guide immediately precedes the intake of a textile fibre drafting mechanism and provides a confined passage through which fibre is fed to said intake and from which fibre is paid out under tension, the guide having fibre guide surfaces that move along with the fibre confined therebetween.

3,562,870

CABLE TIE WITH METAL INSERT HAVING TWO PAWLS

William U. Sund, Brossard, Quebec, Canada, assignor to Electrovert Manufacturing Co., Ltd., Montreal, Quebec, Canada

Filed Apr. 4, 1969, Ser. No. 813,626
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 **9 Claims**



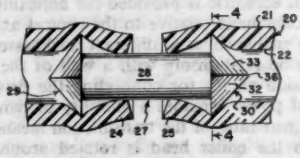
A cable tie for binding plural insulated conductors or the like into a cable includes a relatively elongated substantially flat flexible tongue having an opened frame integral with one end thereof, the tie preferably being formed of a plastic composition material. The frame defines a substantially rectangular opening to receive the opposite end of the tongue which is inserted through the frame from one face thereof and drawn outwardly through the other face. A metal insert is inserted into the frame, as by the application of ultrasonic energy, and has two pawls extending inwardly toward each other and converging toward the exit face of the frame. The free ends of the pawls are spaced a substantial distance inwardly of the exit face, and the pawls flex as the tongue is drawn through the frame and then bite into the side edges of the tongue to prevent retraction of the tongue through the frame.

3,562,871

ENDLESS BELT ASSEMBLY WITH INSERT COUPLING

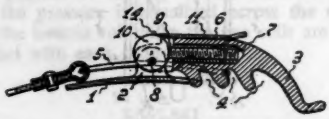
Arnold G. Peterson, Sunapee, N.H., assignor to L. M. & L. Corporation, Claremont, N.H., a corporation of New Hampshire

Original application July 6, 1967, Ser. No. 651,527, now Patent No. 3,461,733, dated Aug. 19, 1969. Divided and this application Apr. 4, 1969, Ser. No. 831,803
Int. Cl. F16h *9/00*
U.S. Cl. 24—31 **4 Claims**



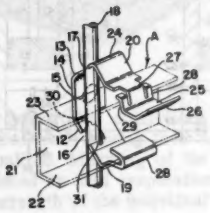
A continuous belt assembly suitable for use in high-velocity, moderate-load power transmission applications comprising, in combination, a novel internal coupling means and a tough extensible, flexible and tear resistant polymeric belting. The fastening means comprises sharp holding edges at either end thereof, such edges being adapted to indent, deform, cut and grip the walls of the belting when said fastening device is inserted into hollow sections of the belting and the belting is subsequently mounted on machinery. The sharp edged insert is free of sharp prongs and undercut barbs, but includes sharp spade-like edges defining a figure of greater periphery than the inside diameter of the hollow tubular belting, the corner edges having obtuse angles on the periphery to limit fracture while deforming the tube into a tight stretch around the periphery.

3,562,872
BUCKLE FOR SKI SHOES
Wilhelm G. Haubensack, 2 Agnesstrasse, 8004 Zurich, Switzerland
Filed May 5, 1969, Ser. No. 821,851
Claims priority, application Switzerland, May 22, 1968, 7,638
Int. Cl. A43c 11/14
U.S. Cl. 24—70 4 Claims



A buckle for ski shoes of the kind in which a loop on one closure flap of the shoe opening is latched over one of a set of aligned projections on a form of over-dead-centre lever pivotally carried by a mounting bracket on the other closure flap, the effective length of the lever arm being adjustable by a screw threaded connection between the lever and mounting bracket. The improvement with which the invention is concerned is the provision of an additional member which is pivoted on the bracket and can be clamped down on the aforesaid lever to retain it in its adjusted fastening position and safeguard the parts against damage.

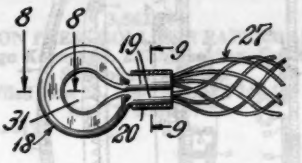
3,562,873
CHANNEL CLIPS
William J. Cumber, Chardon, Ohio, assignor to Erico Products, Inc., Cleveland, Ohio, a corporation of Ohio
Filed Oct. 11, 1968, Ser. No. 766,871
Int. Cl. A44b 21/00
U.S. Cl. 24—81 2 Claims



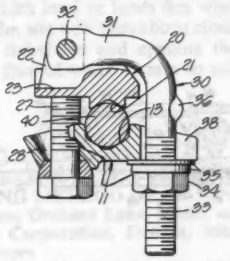
The invention relates to a clamp for securing a channel shaped member to a depending supporting rod or the like, made of a strip of spring steel having a body portion including two angularly disposed straight members formed with aligned side opening notches, with detents formed therein, adapted to receive the rod therethrough. The said straight portions are moved toward each other and then laterally to engage the rod within the notches. Release of the straight portions effects a gripping of the rod by the detents in the notches due to the inherent spring tension of the body portion. Arms integrally formed on the said straight portions, one of which has a reversely bent end, and the other detent means receive and resiliently hold therebetween the longitudinal edge portions of an elongated channel shaped member.

3,562,874
CABLE GRIP
Joseph Di Palma, Merritt St., South Norwalk, Conn. 06854
Filed Jan. 29, 1969, Ser. No. 794,914
Int. Cl. F16g 11/02, 11/14
U.S. Cl. 24—123 8 Claims

A cable grip having a plurality of wire strands forming a woven tubular cable-receiving sheath and a draft end comprising a bunch of unwoven strands forming a loop. A rigid metal sleeve slidably receives and contains said unwoven strands, and is shaped to form an eye portion and adjacent parallel leg portions from which the wires emerge. The leg portions of the sleeve are flattened in a plane parallel to the axis of the eye portion into wire-clamping engagement with the unwoven wires therein, and the eye portion being flattened in a plane perpendicular to the axis of the eye portion into wire-clamping engagement with the unwoven wires within the eye portion. The hole of the eye portion is of such shape as to receive and fit the bolt of a draft clevis when the draft end of the cable grip is inserted in a draft clevis with a minimum of lost motion between the bolt and the eye.



3,562,875
DEAD END CLAMP
L. E. Lindsey, Pasadena, and Herbert P. Sammons, Glendale, Calif., assignors to L. E. Lindsey, Pasadena, Calif.
Filed June 16, 1969, Ser. No. 833,359
Int. Cl. F16g 11/06
U.S. Cl. 24—125 10 Claims

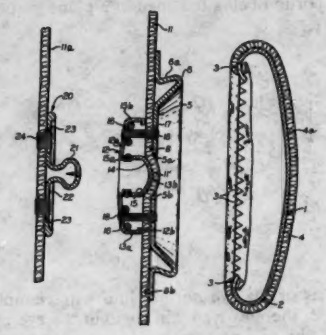


A dead end clamp having a clevis-equipped main body formed lengthwise thereof with a cable-seating channel. A single clamping jaw overlies the channel from one side and is held closed by a single L-shaped bolt pivoted to the upper side of the jaw in cooperation with either one or a pair of cap screws. The latter pass loosely through upwardly flaring openings in the clamp body into threaded bores formed in the jaw, the flaring openings permitting the loosened jaw to pivot laterally away from the channel to its fully open position.

3,562,876
REMOVABLE FABRIC COVERED SHELL ASSEMBLY
Hans A. Pyrm, Woodstock, Conn., assignor to William Prym, Inc., Dayville, Conn., a corporation of New York
Filed Apr. 17, 1969, Ser. No. 816,946
Int. Cl. A44b 1/12, 17/00
U.S. Cl. 24—113 8 Claims

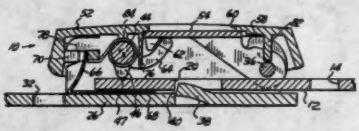
A removable fabric covered shell assembly for attachment to a garment material comprising a formed shell including teeth at the rear for engaging a fabric on the shell,

a backplate having a front side formed with a snap-on engagement ridge complementary to the rear of the teeth of the shell for releasable snapping engagement therewith,



and one part of a snap fastener means formed with sew-on holes and held to the back side of the backplate by threads holding the garment material therebetween.

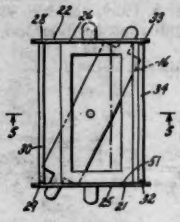
3,562,877
MINIATURE BUCKLE
William L. Pringle, Grosse Pointe, and Gerald J. Partridge, Roseville, Mich., assignors to Jim Robbins Seat Belt Co., Troy, Mich.
Filed Oct. 7, 1968, Ser. No. 765,496
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 11 Claims



A pushbutton actuated buckle assembly having an apertured tongue that is engageable with a lug in the base of the buckle to form a connection between the tongue and the buckle. A rotatable latch is supported in the buckle in a position such that the tongue, when inserted into the buckle, is received between the latch and the buckle base. A latch spring biases the latch toward a locking position in which it moves the tongue toward the base so that its aperture is joined with the lug. A lifting spring, between the tongue and the base, moves the tongue away from the base as the latch is rotated to a release position by depression of the pushbutton.

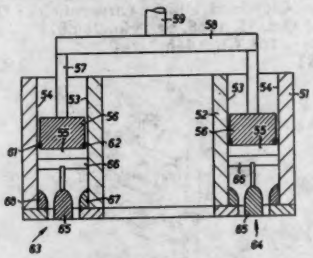
3,562,878
JEWELRY BRACELET CATCH
Boris Shteinshleifer, 245 E. 11th St., New York, N.Y. 10003
Filed Mar. 11, 1969, Ser. No. 806,086
Int. Cl. A44c *5/18*
U.S. Cl. 24—265 5 Claims

A jewelry bracelet catch including first and second mutually engageable members, one of said members defining a recess into which at least a portion of the other of said members may be positioned for non-rotational engagement, and said sliding locking means mounted on one of



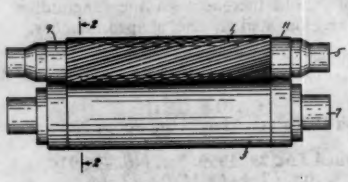
said elements and selectively engageable with at least one recess on the other of said elements.

3,562,879
APPARATUS FOR THE PRODUCTION OF DOUBLE-WALLED PIPES OF CERAMIC MATERIAL
Gottfried Cremer, Junkersdorf, near Cologne, Steyrer Weg 6, Germany; Heinz Behrens, Junkersdorf, near Cologne, 19 am Weidenpesch, Germany; and Hans Joachim Dietzsch, 1 Rue Charles Monnard, Lausanne, Switzerland
Filed Feb. 23, 1966, Ser. No. 529,549
Claims priority, application Germany, Feb. 24, 1965, F 45,345; Apr. 15, 1965, B 81,491
Int. Cl. B28b *3/24, 3/26*
U.S. Cl. 25—15 3 Claims



An extrusion press for producing double-walled pipes of ceramic material comprising an annular cylinder, an annular piston within the cylinder, and an extrusion nozzle within the annular cylinder comprising a plurality of cores suspended on radial suspending means.

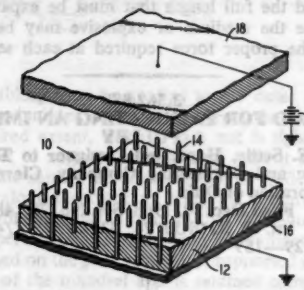
3,562,880
CRIMPING APPARATUS
Harold D. Yarber, Wallace, N.C., assignor to J. P. Stevens & Co., Inc., New York, N.Y., a corporation of Delaware
Filed Aug. 9, 1968, Ser. No. 751,565
Int. Cl. D02g *1/14*
U.S. Cl. 28—1.8 3 Claims



This invention relates to an improvement in apparatus for treating textile materials having a set of opposed surfaces wherein one of the surfaces is engraved with a

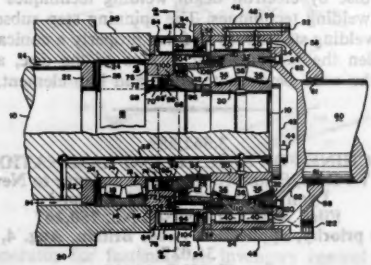
pattern and the other surface is made from a resilient material capable of being deformed into a configuration which matches that of the first surface when the two surfaces are brought into contact with each other under heat and pressure, the improvement comprising having unengraved shoulder portions on each side of the engraved pattern in the top roll and extending above the engraved portion of the top of the shoulder portions whereby the pressure is equalized across the complete width of the bottom roll when the two rolls are brought into contact with each other.

3,562,881
FIELD-IONIZATION ELECTRODES
Alfred E. Barrington, Lexington, Arthur L. Flores, Bedford, and Wayne L. Lees, Lexington, Mass., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Feb. 27, 1969, Ser. No. 802,972
Int. Cl. H01j 9/16, 9/44
U.S. Cl. 29—25.18 5 Claims



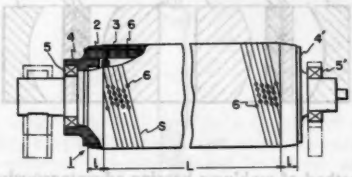
Field-ionization electrodes comprising an array of microscopically small rods having their lengths and tip configurations equalized. Matching of the electrode elements is accomplished by field evaporation permitted by the high physical strength of the individual rods.

3,562,882
ROLL DRIVE THROUGH INTERMEDIATE RACE RING OF CONCENTRIC BEARING
Samuel W. Widmer, South Bend, Ind., and Buel D. Dean, Litchfield, Conn., assignors, by mesne assignments, to The Torrington Company, Torrington, Conn., a corporation of Delaware
Filed June 4, 1965, Ser. No. 461,309
Int. Cl. B21b 13/02
U.S. Cl. 29—115 10 Claims



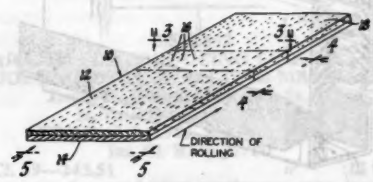
This disclosure relates to the mounting and driving of a roll which is subject of high pressures. The roll is rotatably mounted on a fixed shaft which, in turn, is supported by a triple race bearing with the intermediate race thereof forming a drive coupling between the roll and a drive member. The triple race bearing mounts the shaft for limited flexing under pressure.

3,562,883
SUCTION PRESS ROLL FOR PAPERMAKING
Shogo Kobayashi, 227 Mitoshima, Fuji-shi, Shizuoka-ken, Japan
Filed June 26, 1968, Ser. No. 740,159
Int. Cl. B21h 8/02
U.S. Cl. 29—121 1 Claim



A suction press roll for papermarking machines has a rigid hollow roll covered by a resilient material with aligned suction holes extending through the material and roll for drawing water from a wet web passing thereover and which material has a plurality of drain channels in the periphery thereof connecting each pair of said holes and each of said channels is of greater depth than width providing at least one flexible projecting land between the channels which land or lands flex when pressed by a plain roll and the wet web thereabove closing one channel pushing water therefrom and opening the next channel facilitating the flow of water therein to said holes.

3,562,884
ALUMINUM-BASED ALLOY BEARING MATERIAL AND METHOD OF MAKING
Fred J. Webbere, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed Oct. 29, 1968, Ser. No. 771,416
Int. Cl. B21d 53/10
U.S. Cl. 29—149.5 4 Claims



In a preferred embodiment a cast strip of aluminum bearing alloy containing a minor portion of lead dispersed as small spherical particles in the aluminum matrix is rolled lengthwise, whereby the soft lead particles are flattened and lengthened in the direction of rolling. Sleeve bearing blanks are then cut from the cast and rolled strip in a direction and manner such that the longest dimension of the flattened lead particles in the finished bearing is transverse to the intended direction of rotation of a mating journal member.

3,562,885

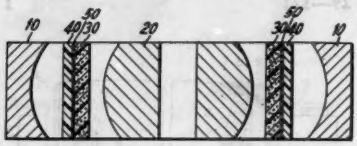
METHOD OF MAKING BEARINGS

Albert R. McCloskey, Fairfield, Conn., assignor to The Heim Universal Corporation, Fairfield, Conn., a corporation of Delaware

Application Feb. 23, 1967, Ser. No. 617,952, now Patent No. 3,471,207, dated Oct. 14, 1969, which is a continuation-in-part of application Ser. No. 566,799, July 21, 1966. Divided and this application Mar. 17, 1969, Ser. No. 807,840

Int. Cl. B23d *53/10;* B23p *11/00*

U.S. Cl. 29—149.5 17 Claims



A method of making a bearing advantageously includes a self-lubricating liner comprising a mixture of adhesive resin and powdered or flocked polytetrafluoroethylene particles, or a woven polytetrafluoroethylene fabric embedded in such resin. The liner is cured under conditions of high pressure and high temperature.

3,562,886

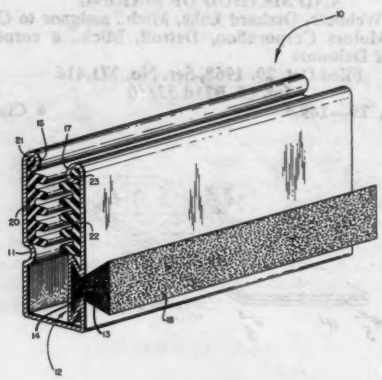
METHOD OF MAKING A FRAMING MEMBER

Harold G. Olson, Westport, Conn., and Leonard W. Johnson, Amesbury, Mass., assignors to The Bailey Company, Inc., Amesbury, Mass., a corporation of Massachusetts

Original application Aug. 16, 1967, Ser. No. 661,007. Divided and this application Jan. 17, 1969, Ser. No. 817,594

Int. Cl. B21d *39/02, 53/74*

U.S. Cl. 29—155 5 Claims



The present invention relates to window frames or sashes made to hold panes of glass or panels of other materials, such as plastic, and in particular to roll-formed framing members, in which the glass supporting gaskets and weatherstripping are assembled together with the framing members as part of the roll-forming process prior to cutting the members into useable lengths.

3,562,887

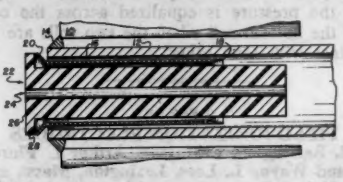
EXPLOSIVE EXPANSION OF LINER SLEEVES

Joseph W. Schroeder, Clark, and Herman P. Smith, Bound Brook, N.J., and Irwin Berman, Bronx, N.Y., assignors to Foster Wheeler Corporation, Livingston, N.J., a corporation of New York

Filed May 8, 1968, Ser. No. 727,530

Int. Cl. B21d *53/00*

U.S. Cl. 29—157.4 5 Claims



By use of an explosive charge together with an accompanying medium two concentric tubes may be expanded at the same time, with the inner tube or liner sleeve expanding and locking to the outer tube and the outer tube expanding into a tube hole in a tubesheet or heat transfer medium. In cases where the inner tube does not extend the full length that must be expanded in the outer tube the medium or explosive may be shaped to provide the proper force required at each section.

3,562,888

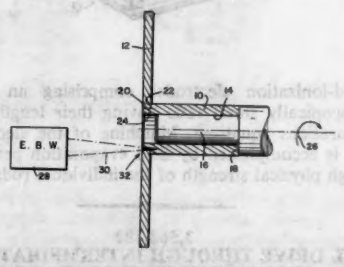
METHOD FOR FABRICATING AN IMPROVED PULLEY

Donald E. Settle, Hope, Ind., assignor to The Reliance Electric and Engineering Company, Cleveland, Ohio, a corporation of Ohio

Filed Dec. 20, 1968, Ser. No. 785,487

Int. Cl. B21d *53/26;* B21k *1/28, 1/47*

U.S. Cl. 29—159 19 Claims



The method of fabricating a V-pulley disc which comprises the steps of providing a metal hub element, providing a substantially flat disc of ductile metal having a central perforation proportioned and designed to receive the hub element, entering the hub element in the perforation and there welding it, and thereafter spinning the disc to frusto-conical shape by pressure exerted generally axially upon one of its faces. The hub element may be welded to the disc by electron beam welding techniques or by inertia welding techniques. The spinning step subsequent to the welding step serves to form properly a conical disc, to harden the belt-engaging surface of the disc, and to check the weld between the disc and hub element.

3,562,889

MACHINE FOR ASSEMBLING LAMINATIONS

Basil W. Rule, Stamford, England, assignor to Newage Lyon Limited, Stamford, England

Filed Aug. 5, 1968, Ser. No. 750,247

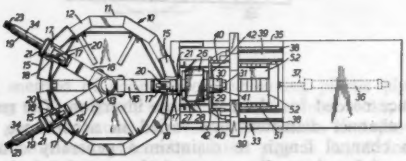
Claims priority, application Great Britain, Aug. 4, 1967, 36,027

Int. Cl. H05k *13/00*

U.S. Cl. 29—203 12 Claims

The invention relates to an assembly machine or fixture device for assembling stamped iron rotor laminations into

a pack, compressing the pack, and holding the pack compressed whilst it is seam-welded together to form the laminated iron rotor core of a dynamo-electric machine. A pedestal provides a circumferential horizontal track around a vertical axis, and a number of trolleys are mounted on the pedestal for movement along the track and around the vertical pedestal axis. Each trolley has bearings in which is journalled a mandrel extending radially with respect to the pedestal axis, the outer end portion of the mandrel projecting beyond the pedestal to constitute a horizontal working portion located at a convenient working height on which a required number of the laminations can be assembled in a pack. The trolley carrying the pack of laminations is then moved along the track to bring its mandrel into alignment with a fixed, horizontal hydraulic or pneumatic ram. The ram has



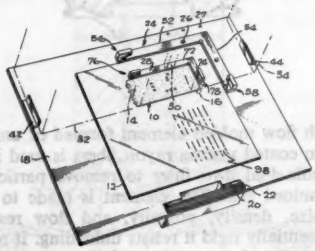
fittings enabling it to be applied to the outer end of the pack of laminations so as to compress the pack axially to the desired extent, when a lock nut is tightened onto the mandrel to engage the pack and hold it compressed to enable the ram to be disengaged. The trolley can then be moved along the track to bring the compressed pack out of alignment with the ram, so that the required seam-welding operations and the fitting of damper bars can be performed on the pack whilst it is supported on the projected end of the mandrel and is retained compressed by the lock nut. Finally the trolley is swung back into alignment with the ram, the lock nut is removed and the ram plunger is coupled to a yoke fitted behind the radially-inner end of the pack, and the ram is operated in reverse to withdraw the completed pack off the mandrel and onto a carrier positioned to receive it.

3,562,890

FASTENER APPARATUS

Herbert la Mers and Herbert N. Sandel, Los Angeles, Calif., assignors to Rapid Merchandising Company, Incorporated, Minneapolis, Minn., a corporation of Minnesota

Filed Sept. 23, 1968, Ser. No. 761,435
Int. Cl. B23p *19/04;* **B23q** *17/00*
U.S. Cl. 29—208 **8 Claims**



Apparatus for fastening an inventory control card to a record album. The apparatus comprises an album nest for receiving a record album, a movable card nest, and an album sensor. When the sensor detects an album in the album nest, it operates a piston that moves the card nest against the album to clamp it in place. Another sensor detects the presence of a card within the card nest to operate machinery that fastens the card onto the album.

3,562,891

VALVE SERVICE TOOL

William E. Earl, Downey, Calif., assignor to Earl Mfg. Co., Inc., Santa Fe Springs, Calif., a corporation of California

Filed July 24, 1968, Ser. No. 747,281
Int. Cl. B23p *19/04*
U.S. Cl. 29—221.5 **5 Claims**

The tool includes a handle having a foot member rigidly attached to its lower end. A plate is pivotably attached to the handle so that a jaw, formed on one end of the plate, closes against one edge of the foot member; and a leg is formed on the other end portion of the plate. In response to a lateral force applied to the upper end of the handle the tool pivots on the leg against a surface of the wheel rim so as to cause the jaw to close on a valve disposed between the jaw and the foot member, and to exert on the valve a force having a component normal to the wheel rim surface encompassing the valve. The plate is configured so that in the absence of applied forces the jaw assumes a predetermined opened position whereby the tool may be easily positioned with the jaw encompassing the valve stem.

3,562,892

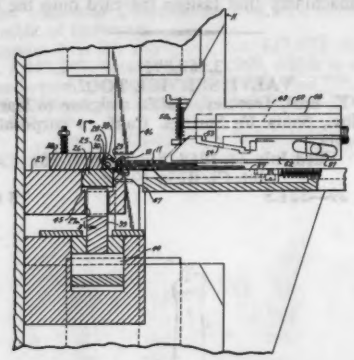
APPARATUS FOR PRODUCING LINK MEANS FOR JOINING ENDS OF BELTING MATERIAL

James N. Laneri, 5266 40th St. S., St. Petersburg, Fla. 33711

Filed Sept. 3, 1968, Ser. No. 756,944
Int. Cl. B23p *11/00*
U.S. Cl. 29—243.51 **13 Claims**

Apparatus for producing continuous tape means for joining ends of continuous conveyor belt or like material, includes means for crimping angularly disposed arms of series of apertured links, to embed barbed ends of arms into one edge of a continuous tape. Includes indexing mechanism for progressively moving successive links into position between relatively movable upper and lower crimping heads. Edge of tape is pressed firmly between arms of links into rigid contact with shoulder part of link, in timed relation to reciprocating crimping heads to deform link arms inwardly into tight engagement with opposite sides of the belt material, anchoringly to embed

barbs of arms into the tape material. Uniformly spaced link eyelets in said tape when fastened are interengagable in alternation to align slots of axially aligned openings of

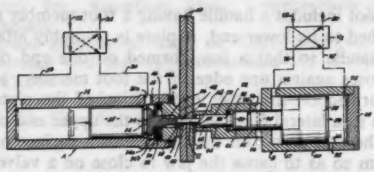


eyelets, for reception of elongated hinge cable attached to a threading shuttle, moved through aligned eyelet apertures by means of shuttle extension movable through aligned eyelet slots.

3,562,893
APPARATUS FOR DRIVING RIVETS USING EXPLOSIVE CHARGE

James C. Winslow, Sierra Madre, and Ralph D. Adams, Glendora, Calif., assignors to Omark-Winslow Aerospace Tool Co., Portland, Oreg., a corporation of Oregon

Filed May 28, 1968, Ser. No. 732,684
Int. Cl. B23p *11/00*
U.S. Cl. 29—243.53 17 Claims



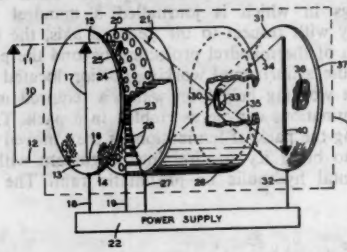
A rivet driving system wherein a mechanical blow is delivered to one end of a rivet by an air-driven hammer striking an impact member which acts as a rivet set engaging and upsetting a head on this end of the rivet. The unheaded opposite end of the rivet delivers an initial shock, as this upsetting commences, against an upsetting tool, or second rivet set, positioned thereagainst, which in turn transmits a shock to an explosive charge. The explosive charge thereby explodes, and the resulting gas pressure and shock drives the last-mentioned rivet set back to form a head on the corresponding end of the rivet, while the first mentioned rivet set is still upsetting a head on the first mentioned end of the rivet.

3,562,894
METHOD OF MAKING ELECTRON MULTIPLIER WAFER

Martin Rome, Princeton, N.J., assignor, by mesne assignments, to Weston Instruments, Inc., Newark, N.J., a corporation of Delaware

Original application June 21, 1967, Ser. No. 647,822, now Patent No. 3,407,324, dated Oct. 22, 1968. Divided and this application Aug. 26, 1968, Ser. No. 810,398
Int. Cl. B23p *17/00*
U.S. Cl. 29—412 3 Claims

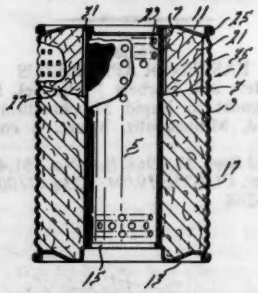
An illustrative embodiment of the disclosure discloses a plano-concave wafer of channel electron multipliers in an electron-optical system that produces inverted and intensified images of faintly illuminated objects. The individual channels are relatively short at the center of the wafer and gradually increase in length toward the periphery in order to produce the concave equipotential surface needed for electron image inversion. The respective channel diameters are varied in accordance with each channel length to maintain a generally constant ratio of length to diameter and the associated electron gain for all of the channels in the wafer.



3,562,895
METHOD OF MAKING FILTER

Louis F. Niebergall and James C. McLaren, Racine, Wis., assignors, by mesne assignments, to Tenneco Inc., Houston, Tex., a corporation of Delaware

Application Jan. 11, 1967, Ser. No. 613,385, now Patent No. 3,504,800, dated Apr. 7, 1970, which is a continuation of application Ser. No. 185,661, Apr. 6, 1962. Divided and this application May 21, 1969, Ser. No. 826,622
Int. Cl. B23p *17/00*
U.S. Cl. 29—419 2 Claims



A high flow molded element formed of uniform diameter resin coated viscose rayon fibers is used in a parallel dual media-dual flow filter to remove particles above a predetermined size. The element is made to a predetermined size, density, porosity, and flow resistance and being essentially rigid it resists unloading. It may be conically shaped to have a substantially uniform rate of flow or internally flocked to provide more uniform porosity. An end cap may be adhered to the element as a subassembly and the inlet and outlet faces are preferably spaced from adjacent portions of the housing to insure flow to the entire areas of these faces.

3,562,896

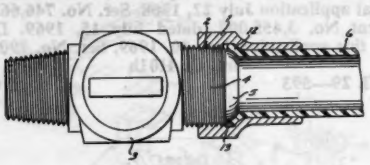
METHOD OF ATTACHING PLASTIC PIPE TO METAL FITTINGS

Harold E. Wilson, 3825 Cedar Ave., Long Beach, Calif. 90807

Application Apr. 24, 1967, Ser. No. 633,077, now Patent No. 3,408,098, dated Oct. 29, 1968, which is a continuation-in-part of application Ser. No. 537,134, Mar. 24, 1966. Divided and this application Aug. 26, 1968, Ser. No. 755,222

Int. Cl. B23p *11/00*

U.S. Cl. 29—443 2 Claims



A method of coupling or connecting plastic pipe or tubing to brass goods normally used in waterworks, water and gas distribution, and industrial plants that provides a tube nut into which the plastic pipe is flared, locking them together longitudinally, yet permitting relative rotation of the pipe and nut, in which a flare tool has a flaring surface and a following cylindrical surface advancing over threads in the nut to shut off flow of plastic material into the threads, the flare being made against the interior of the nut at one radius of curvature and the opposite interior surface of the pipe is shaped at a larger radius of curvature. Thermoplastic pipe having internal diameter iron pipe dimensions and other pipe having outer diameter copper tube dimensions, both of polyethylene or polyvinyl chloride in ⅜" to 2" sizes are popularly used in such couplings.

3,562,897

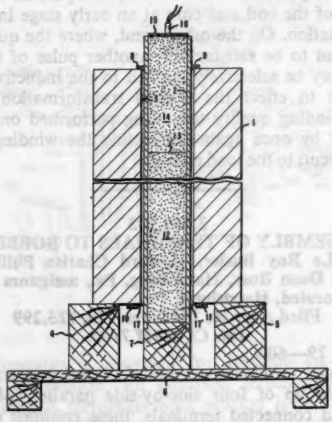
EXPLOSION BONDING OF TUBES

Joseph Buchwald, Philadelphia, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Continuation-in-part of application Ser. No. 740,671, June 27, 1968. This application Nov. 27, 1968, Ser. No. 786,533

Int. Cl. B23k *21/00*

U.S. Cl. 29—470.1 11 Claims



In the process for metallurgically bonding a lining tube to the inside surface of a second tube by propelling the lining tube into a progressive collision with the second tube by detonating an explosive charge within the lining tube, improved bonding at the initially colliding tube ends is obtained by employing, at the initiation end of the explosive charge, an explosive which has a higher detonation velocity and/or explosive loading than the explosive which extends through the remaining length of the lining tube.

3,562,898

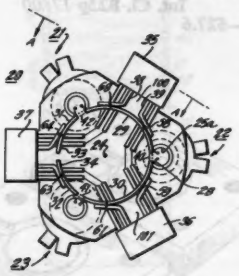
METHOD FOR FORMING A MULTIPLE SECTIONAL RING

Leonard D. Minutillo, Parlin, N.J., assignor to Griffiths Electronics, Inc., Linden, N.J., a corporation of New Jersey

Filed May 8, 1969, Ser. No. 822,961

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.3 3 Claims



A method and apparatus for forming a ring structure comprised of a multiple number of elements substantially forming the ring, which sections are utilized in cathode ray guns to provide the electrical circuit for energizing the cathode filaments of the electron gun. Four separate sections form the ring. The method and apparatus for forming the arrangement is to provide a single damp member having the thickness of the order of 5 mils and mounting the member upon a jake to form a substantially circular shaped configuration. The member is then positioned in close proximity to the electron gun structure adjacent the elements to which it is being mechanically connected. The ring shaped member is then welded to the supporting structures and, after weldment, is positioned in a ring cutter assembly which cuts the substantially ring shaped member at three points located approximately 120° apart to thereby form four separate elements which are then utilized for electrical connection to filament leads of a plurality of cathode heaters mounted within the electron gun structure. This technique replaces the conventional technique in which six separate elements are utilized to form the filament ring.

3,562,899

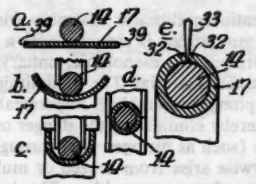
METHOD OF FORMING A SHEATHED ELEMENT

Thomas C. Stout, Concord, Mass., and Andrew J. Kaiser, Muskegon, Mich., assignors to Brunswick Corporation

Filed June 13, 1968, Ser. No. 736,649

Int. Cl. B21d *39/04*

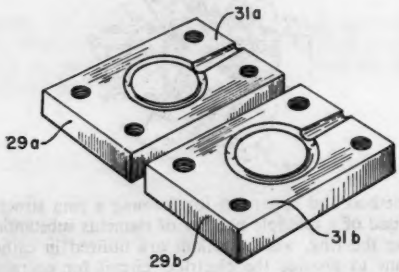
U.S. Cl. 29—474.1 5 Claims



A method of forming a clad wire wherein a wire is fed longitudinally to a cladding zone, a strip of sheathing material is deformed about the wire, opposed por-

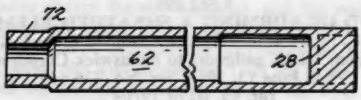
tions of the strip are secured together by means extending less than fully through the strip to define an effectively tubular sheath about the wire. The sheathing material herein is metal and the securing of the apposed portions of the sheath is effected by welding. The sheathed wire may be subsequently cut to preselected lengths for further processing.

3,562,900
METHOD OF MAKING A JEWELRY MOLD
John L. Buehler, Indianapolis, Ind., assignor to The Buehler Corporation, Indianapolis, Ind., a corporation of Indiana
Original application Oct. 19, 1966, Ser. No. 587,833, now Patent No. 3,515,366, dated June 2, 1970. Divided and this application Mar. 12, 1969, Ser. No. 871,801
Int. Cl. B23p *17/00*
U.S. Cl. 29—527.6 **3 Claims**



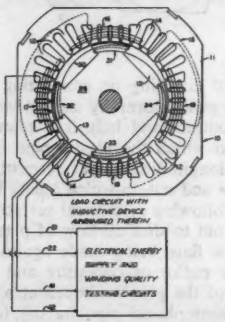
Method and apparatus for making a mold for wax replicas for use in lost wax casting process. Model is supported in a frame. A mold material is poured into said frame. Screws for later alignment are provided and are molded into said mold. Mold material is cured and cooled. Screws are removed and mold is then cut in two.

3,562,901
METHOD OF MANUFACTURING PNEUMATIC EQUILIBRATOR ASSEMBLY
Joseph Ray, 566 E. Fulton St., Long Beach, N.Y. 11561
Filed Jan. 13, 1969, Ser. No. 790,790
Int. Cl. B23p *13/04*
U.S. Cl. 29—558 **2 Claims**



A pneumatic equilibrator assembly for balancing the weight of a gun muzzle is provided with a tubular plunger assembly formed as a monolithic, unitary structure from a forging quality material. The monolithic, unitary structure of the plunger assembly is impermeable to gas under pressure, thereby eliminating the danger of a loss of pressurizing gas (such as nitrogen gas) through defects which might otherwise arise from brazed or multiple-piece constructions for plunger assemblies. The improved plunger assembly is formed by boring internal openings into opposite ends of a cylindrical blank, machining a major part of the outside surface of the blank to a desired diameter but leaving an excess of thickness of material at an open end of the blank, and pressure forging the end of the blank having the excess material so as to simultaneously reduce its inside and outside diameters.

3,562,902
METHOD FOR TRANSFORMING AND TESTING OF ELECTRICAL COILS IN AN INDUCTIVE DEVICE
Robert Green, De Kalb, Ill., assignor to General Electric Company, a corporation of New York
Original application July 22, 1968, Ser. No. 746,663, now Patent No. 3,455,007, dated July 15, 1969. Divided and this application Jan. 10, 1969, Ser. No. 790,290
Int. Cl. H01h
U.S. Cl. 29—593 **5 Claims**

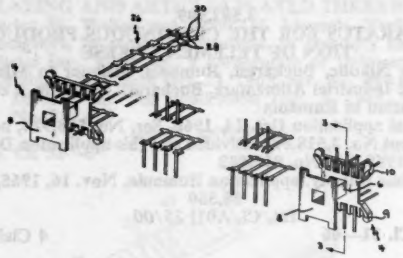


An inductive device, for instance a magnetic core having electrical coils or windings carried in slots, for arrangement in a load circuit. At least one pulse of electrical energy is selectively applied to the load circuit from an electrical energy supply circuit for transforming the coils from one configuration into another. A winding quality testing circuit, such as one to perform a high potential test, is then selectively connected to the load circuit for automatically conducting the test on the inductive device while it is still arranged in the load circuit to determine the quality of the device, such as detection of winding-to-ground faults. In the event that a winding defect is detected, further transformation of the electrical coils is discontinued. This interruption permits repair, if possible, of the coil and core at an early stage in the coil transformation. On the other hand, where the quality has been found to be satisfactory, another pulse of electrical energy may be selectively applied to the inductive device if desired to effect the desired transformation, with a second winding quality test being performed on the coil thereafter by once again connecting the winding quality testing circuit to the load circuit.

3,562,903
ASSEMBLY OF TERMINALS TO BOBBINS
Willard Le Roy Busler, Howard Charles Phillips, and Milton Dean Ross, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Apr. 30, 1968, Ser. No. 725,299
Int. Cl. H01f *7/05*
U.S. Cl. 29—602 **1 Claim**

Elongated terminals are manufactured as a continuous strip made up of four side-by-side parallel columns of end-to-end connected terminals, these columns of terminals defining successive rows of side-by-side terminals, each row being separated from the next adjacent row by a transversely extending slug strip. A plurality of terminals are assembled to a bobbin or the like by feeding the strip until the leading ends of the leading row of terminals

extend through a flange of the bobbin. The leading row, and the slug strip integral with the trailing ends of the terminals in the leading row, is severed from the next adjacent row of terminals. This slug strip remains integral with the inserted terminals until further forming operations are carried out and functions to maintain alignment of the terminals in the bobbin during these forming operations. The subsequent forming operations, in the disclosed embodiment, comprise the steps of bending the leading ends of the terminals through an angle of 90° until they lie in the plane of the flange of the bobbin. The terminals are thereafter staked to the bobbin flange and the slug strip is then severed from the trailing ends of the terminals.



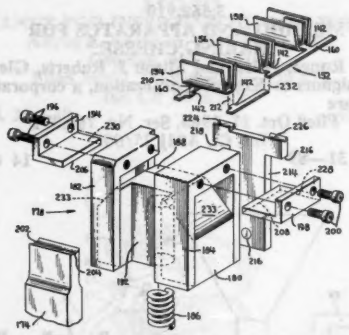
3,562,904
METHOD FOR FORMING AN INSULATED ELECTRICAL CONNECTION

Ralph Rupp Lau, Harrisburg, Pa., and Gilbert Carl Sitz, Richardson, Tex., assignors to AMP Incorporated, Harrisburg, Pa.

Original application Sept. 23, 1965, Ser. No. 489,558, now Patent No. 3,386,153. Divided and this application Feb. 8, 1968, Ser. No. 704,048

Int. Cl. H01r *43/00*

U.S. Cl. 29—628 **2 Claims**



An apparatus is provided for forming an insulated electrical connection. An electrical terminal having an open U-shaped ferrule-forming portion is fed to a first crimping station. The stripped end of an insulated electrical conductor is inserted into the ferrule-forming portion and the terminal is crimped to the conductor. An open U-shaped insulating member is fed to a second crimping station. The terminal and conductor previously joined are transferred to the second crimping station in overlying relationship with the insulating member. The insulating member is then crimped around the terminal and conductor.

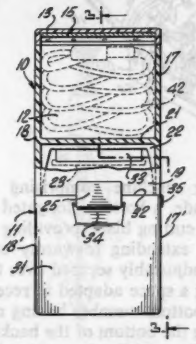
3,562,905
COMBINED ELECTRIC DRY SHAVER AND TRAVEL CASE

William Rakocy, Clifton, and Seymour Rappoport, Rumson, N.J., assignors to Ronson Corporation, Woodbridge, N.J., a corporation of New Jersey

Filed Sept. 12, 1968, Ser. No. 759,277

Int. Cl. B26b *19/38*

U.S. Cl. 30—34 **6 Claims**



A compact travel case for an electric dry shaver is provided having a dual-sectioned, removably interlocked housing wherein the shaver itself serves as an integral portion of the travel case when not in use, thereby constituting one of the sections, and the other section, which protects the shaver head, is formed with a compartment to accept and store the shaver line cord. A safety tab is also provided on the travel case to lock the shaver head release mechanism while the two sections of the travel case are joined in order to prevent accidental disengagement of the shaver head assembly.

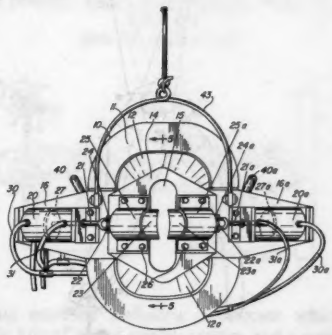
3,562,906
ANIMAL HORN CUTTING DEVICE

Everett Edwards and Fred R. Johnson, St. Paul, Minn., assignors to Armour and Company, Chicago, Ill., a corporation of Delaware

Filed Oct. 28, 1968, Ser. No. 771,053

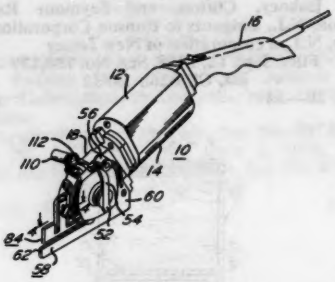
Int. Cl. B26b *17/00*

U.S. Cl. 30—180 **18 Claims**



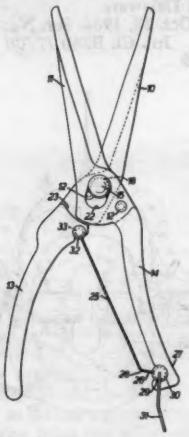
An apparatus for cutting the horns from animal carcasses. Cutting blades mounted in a frame close together in a manner to insure cutting of the horn at or below the surface of the skull.

3,562,907
CARPET CUTTING MACHINE
Nathan Greenberg, 5016 Bingham St., Philadelphia, Pa. 19120
Filed Apr. 3, 1968, Ser. No. 718,585
Int. Cl. B26b *15/00*
U.S. Cl. 30—233 9 Claims



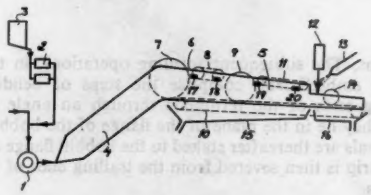
Carpet cutting machine comprising a motor driven rotary cutting blade, a bottom elongated member secured proximate to the cutting blade providing a stationary cutting portion and extending forwardly of the blade, and a guide element adjustably secured over the bottom member for providing a space adapted to receive carpet which is to be cut, the bottom member having narrow top linear edge for engaging the bottom of the backing of the carpeting without binding, while the guide element is of flat thin dimensions for being received between linear rows of loop pile carpeting and adjusted for slidably engaging the top of the carpet backing for guiding the machine therealong and separating the adjacent rows of loops so that same are not cut by the rotary blade of the machine.

3,562,908
HAND TOOLS
Edward A. Rogers, London, England, assignor to Wilkinson Sword Limited, London, England, a British company
Filed June 20, 1968, Ser. No. 738,484
Claims priority, application Great Britain, June 23, 1967, 28,999/67
Int. Cl. B26b *13/16*
U.S. Cl. 30—261 6 Claims



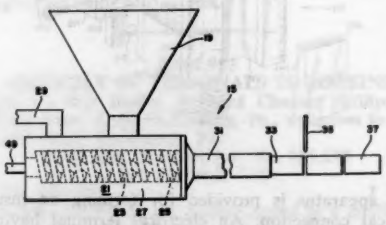
A hand tool has two cutter members connected together by a pivot assembly which can readily be rendered inoperative by lateral movement from the pivot axis and withdrawal of the assembly from one of the members by passage of the assembly through a bore of larger diameter than that accommodating the assembly in the operative position. The pivot assembly is biased to the operative position on the pivot axis by a leaf spring having a pivot at each end, the pivots engaging in respective recesses in the handles, one recess being adjacent the pivot assembly and the other remote from the pivot assembly.

3,562,909
APPARATUS FOR THE CONTINUOUS PRODUCTION OF TELEMEA CHEESE
Vasilie Nikolic, Bucharest, Rumania, assignor to Ministerul Industriei Alimentare, Bucharest, Rumania, a corporation of Rumania
Original application Oct. 24, 1966, Ser. No. 588,924, now Patent No. 3,518,094. Divided and this application Dec. 31, 1968, Ser. No. 810,882
Claims priority, application Rumania, Nov. 16, 1965, 50,550
Int. Cl. A01j *25/00*
U.S. Cl. 31—46 4 Claims



An apparatus for the continuous production of telemea cheese in which a coagulating mixture of milk and a coagulating agent is passed continuously upwardly through a coagulating duct to form a curd emerging at the upper end of the duct. The curd is then passed along a treatment path provided with cutting disks and squeezing conveyors which alternately slice through the continuous curd layer and express whey from the cut curd. After a final squeezing between conveyor belts, the cheese is cut into blocks and rinsed.

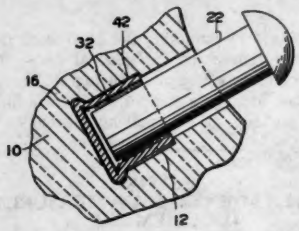
3,562,910
METHOD AND APPARATUS FOR MAKING CHEESE
Heinz F. Runge, Niles, and Miron J. Roberts, Glenview, Ill., assignors to Kraftco Corporation, a corporation of Delaware
Filed Oct. 17, 1968, Ser. No. 768,391
Int. Cl. A01j *25/00*
U.S. Cl. 31—89 14 Claims



A method for the manufacture of cheese from cheese curd which is in particulate form. In the method, a cheese producing media such as cow's milk is treated in accordance with conventional procedures for the particular type of cheese to be produced so as to provide curd and whey. Thereafter the whey is drained from the curd

until the level of moisture in the curd is that desired in the finished cheese product. The particulate curd is then transferred to apparatus wherein the curd is transferred and formed into a cohesive curd mass without damage to the curd particle. The mass is then cut into suitable-sized pieces and wrapped or otherwise packaged.

3,562,911
METHOD AND COMPOSITION FOR PLATINUM PLATING AND ARTICLES PLATED THEREWITH
Charles W. Walter and Frank H. Leaman, York, Pa., assignors, by mesne assignments, to Dentsply International Inc., York, Pa., a corporation of Delaware
Original application Oct. 21, 1965, Ser. No. 499,661. Divided and this application Dec. 3, 1968, Ser. No. 810,416
Int. Cl. A61c *13/00*
U.S. Cl. 32—8 6 Claims

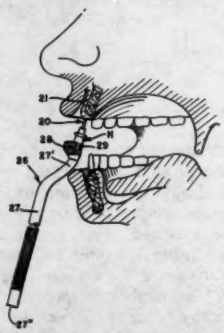


An artificial tooth is provided comprising a porcelain body containing a noble metal or alloy pin coil plated with a continuous layer of platinum. The pin coil is plated with an electroless platinum plating solution consisting essentially of:

(a) chloroplatinic acid;
(b) a platinum reducing agent selected from the group consisting of hydrazine and salts of hydrazine;
(c) hydrochloric acid;
(d) a wetting agent; and
(e) water.

The continuous layer of platinum can approach a thickness of one mil.

3,562,912
APPLIANCE FOR INSERTING DENTAL IMPLANTS
Alfred E. Edelman, 2723 Federal St., Camden, N.J. 08105
Filed July 7, 1969, Ser. No. 839,377
Int. Cl. A61c *3/00*
U.S. Cl. 32—40 10 Claims

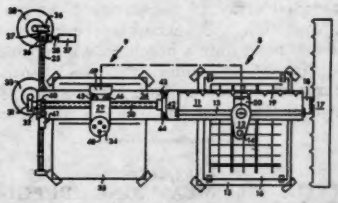


An elongated handle is provided at one end thereof with a removable head for supporting and driving a dental implant into a patient's jaw bone by impacts delivered to the handle. A variety of heads are disclosed for selective use with the same handle at different stages of the implant inserting procedure, and also for supporting the implant in line with or angularly offset to the direction of impact, as dictated by limitations of space. Resilient means in the head frictionally retain the implant in its operative position.

3,562,913
ROOT CANAL FILE
Dennis W. Saffro, 10536 Garwood Place, West Los Angeles, Calif. 90024
Filed Aug. 11, 1969, Ser. No. 848,835
Int. Cl. A61c *5/02*
U.S. Cl. 32—57 8 Claims

An endodontic instrument for treating a pulp canal, including an elongated member having a fluted cutting portion at one end, a handle at the other and an intermediate part between the cutting portion and the handle, a stop member being positionable on the intermediate portion at different longitudinal locations as established by laterally projecting ribs to adjust the effective length of the cutting portion, the stop member having two abutment surfaces, each of which may be positioned adjacent the tip of the cutting portion for varying the setting of the stop member. Alternatively, the intermediate portion of the elongated member may be threaded and the stop member in the form of a nut.

3,562,914
METHOD AND ARRANGEMENT FOR REPRODUCING LINE PATTERNS
Hartvig Soe, Alvsjo, Sweden, assignor to Misomex Aktiebolag, Hagersten, Sweden, a corporation of Sweden
Filed Feb. 13, 1969, Ser. No. 799,063
Claims priority, application Sweden, Feb. 15, 1968, 1,984/68
Int. Cl. B43l *13/10*



A ruling machine including a scanner which scans each single line of a rectangular pattern and a writer operatively connected to the scanner to reproduce the lines. An electronic device coordinates the scanner and the writer concerning location and length of line information. The scanner and the writer are each movable in two mutually perpendicular directions. The writer includes a

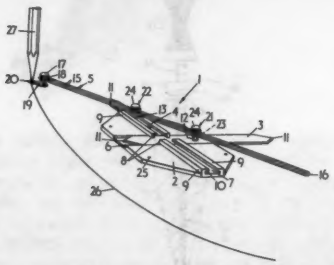
device for fixing it step-wise in both directions in exact coincidence with a predetermined imaginary square pattern. Further means lock the writer against movement in one direction during reproduction of a line in the other direction.

3,562,915

DEVICE FOR DRAWING ELLIPTICAL PATHS

George Brown, Welwyn Garden City, England, assignor to Ellipstruments Limited, Harpenden, England, a British company

Filed May 6, 1969, Ser. No. 822,278
Claims priority, application Great Britain, May 7, 1968, 21,602/68
Int. Cl. B43l *11/04*
U.S. Cl. 33—31 **2 Claims**



An ellipse drawing instrument having two sliding members slidable longitudinally in crossing slots. The sliding members are pivotably connected to a single drawing arm, so that as said members reciprocate in their respective slots, a point on the arm describes an elliptical path.

3,562,916

RETRIEVABLE BOREHOLE EXTENSOMETER

Maynard Duckworth, Denver, Colo., assignor to the United States of America as represented by the Secretary of the Interior

Filed May 14, 1969, Ser. No. 824,642
Int. Cl. G01n *3/00;* **E21b** *47/00*
U.S. Cl. 33—125 **9 Claims**

Expandable mechanical anchors are linked to a sensor-head for measuring deformation of a formation surrounding a borehole. The anchors are similar in operation to scissor-type jacks, and have radially extending shoes for securing them to the wall of a borehole. The sensor-head is designed for mounting within the collar of a borehole and has a radial array of displacement sensors. When placed for operation, the anchors are mounted serially behind one another within a borehole, with an individual mechanical linkage extending from each anchor and through passages in intermediate anchors, to join with an individual displacement sensor in the sensor-head.

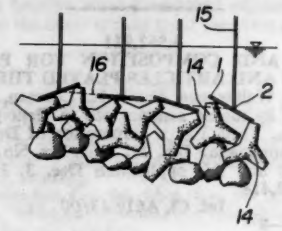
3,562,917

APPARATUS FOR MEASURING IRREGULAR SURFACES OF DEPOSITS OF CONCRETE BLOCKS OR RUBBLE MOUNDS

Ken Matsui, Nagoya-shi, Japan, assignor to Nippon Tetrapod Co., Ltd., Tokyo, Japan, a corporation of Japan

Filed June 5, 1968, Ser. No. 734,600
Int. Cl. G01b *3/00, 5/20;* **G01c** *7/00*
U.S. Cl. 33—126.5 **4 Claims**

Apparatus for measuring an irregular surface of a deposit is comprised by a perforated or grid shaped circular or polygonal flat plate or frame structure with a measuring point at the center thereof and a layer of tetrapods deposited on the irregular surface, all of one size which is such that the frame member will cover at least two



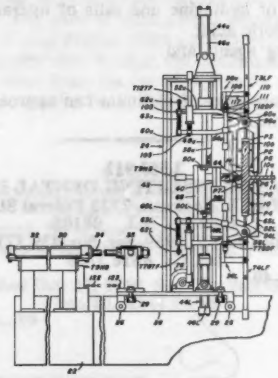
of them, to obtain by sounding the layer with the frame, a reliable measurement of the general configuration or envelope of extremely irregular surfaces. The tetrapods may be incorporated in a structure which is built up on the irregular surface, as in repairing a breakwater.

3,562,918

APPARATUS FOR CONTOUR MEASUREMENT OF A MEMBER

Herbert F. Ertman, Wilkins Township, Allegheny County, Pa., and Boris Phillips, Los Angeles, Calif., assignors to United States Steel Corporation, a corporation of Delaware

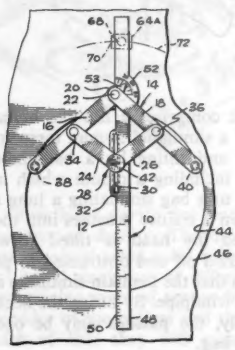
Filed Feb. 26, 1969, Ser. No. 802,552
Int. Cl. G01b *5/02*
U.S. Cl. 33—174 **16 Claims**



This invention relates to apparatus for continuously determining a dimension of a member, the apparatus having a frame disposed adjacent the path of movement of the member, a carriage reciprocable on the frame toward and away from the member, drive means connected to the carriage and a sensing assembly on the carriage for continuously measuring the dimension. The sensing assembly has a movable member reciprocable on the carriage toward and away from the dimension, sensing assembly drive means connected to the movable member, a first scanning member and a second scanning member pivoted on the movable member, a first probe on the first scanning member, and a second probe on the second scanning member and biasing means connected to the

first scanning member and to the second scanning member for biasing the first probe toward the second probe. A proximity member is on the carriage for detecting the member and is connected to the drive means and the sensing assembly drive means. The proximty member is operable when it engages the member to stop the drive means and movement of the carriage toward the member and to start the sensing assembly drive means thereby causing the sensing assembly to move from an initial position toward the dimension so that the first probe and the second probe engage the member and continuously measure the dimension during movement of the sensing assembly toward the member.

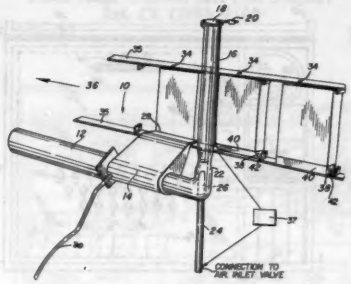
3,562,919
LAYOUT TOOL
Robert G. Green, Lancaster, Calif., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Aug. 29, 1968, Ser. No. 756,266
Int. Cl. B23b *49/02*
U.S. Cl. 33—189 **5 Claims**



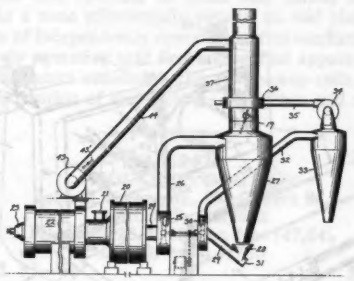
A compact layout tool for machine shop use to locate a point in precise relationship to a straight or arcuate reference edge. The tool comprises a straight edge blade, and a parallelogram structure mounted on the blade. Two of the opposite corners of the parallelogram structure are held on the straight edge, one pivotally joined thereto and the other constrained to movement therealong. The other two corners lie on opposite sides of the straight edge, and a pair of pins is mounted outwardly of these corners. When the pins engage a reference edge, the straight edge blade extends perpendicular to the reference edge. The parallelogram structure can be opened for large workpieces, and can be collapsed for carrying the tool in a shirt pocket.

3,562,920
HEAT SEALING DEVICE
Ralph O. Vuilleumier, Malvern, Pa., and Giulio B. Bagnatori, Wilmington, Del., assignors to Container Corporation of America, Chicago, Ill., a corporation of Delaware
Filed Feb. 17, 1969, Ser. No. 799,825
Int. Cl. F26b *19/00*
U.S. Cl. 34—48 **7 Claims**

In a machine for bonding selected surfaces of a container formed from paper, a device for supplying heated air against a selected surface to be bonded comprises nozzle means for directing heated air against such surface, means for supplying heated air to the nozzle means, a conduit connected at one end to the nozzle means and having a normally closed valve spaced from that end, a conveyor for carrying the containers past said nozzle means, and means responsive to stopping the conveyor for opening the valve to divert heated air from said nozzle means through said conduit into the atmosphere thereby preventing overheating of containers positioned on the conveyor adjacent the nozzle means.



3,562,921
DEHYDRATOR WITH ODOR INCINERATION
Gordon J. Lindl, West Allis, Wis., assignor to Arnold Dryer Company, Milwaukee, Wis., a corporation of Wisconsin
Filed Aug. 18, 1969, Ser. No. 850,813
Int. Cl. F26b *19/00*
U.S. Cl. 34—63 **7 Claims**

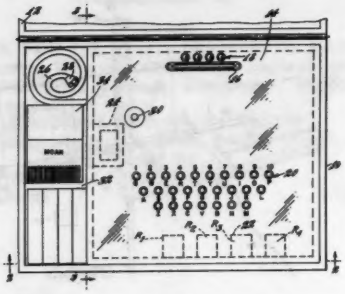


The stack from the main collector of a dehydrator is equipped with a superheating burner to which primary combustion air is furnished from the exhaust of an auxiliary collector such as the cooling collector, the hammer mill collector, or the pellet cooling collector, or combinations of said auxiliary collectors. The superheating burners are positioned to incinerate odors and particulate matter discharged from the main dryer collector and a substantial percentage of superheated gases are returned to the furnace for the main dryer.

3,562,922
CARD PROGRAMMED TEACHING MACHINE
Clarence Jack Friedman and Paul Gorman, both of 9726 Susan Road, Philadelphia, Pa. 19115
Filed July 5, 1968, Ser. No. 742,756
Int. Cl. G09b *7/02*
U.S. Cl. 35—9 **1 Claim**

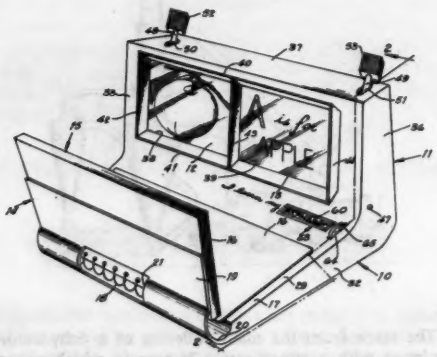
A card programmed teaching machine including a keyboard, circuits leading to a multipin connector socket through operative relays and programmed cards insertable within the said socket to set the entire apparatus for operation. The card determines which keys on the keyboard

will activate the relays, which in turn feed annunciator lights to indicate the correctness of a part of the total



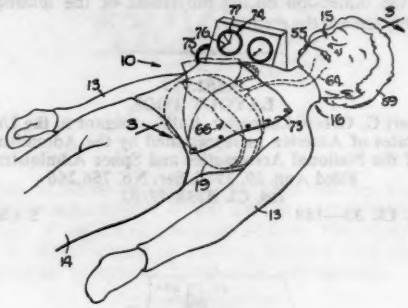
response. The relays operate in sequence with each succeeding relay controlling the operation of the following relay.

3,562,923
EDUCATIONAL AID VIEWING APPARATUS
Ruth G. Chuy and Daniel T. Chuy, both of 15447 Sorrento, Detroit, Mich. 48227
Filed Aug. 26, 1968, Ser. No. 755,062
Int. Cl. G09b *3/00*
U.S. Cl. 35—9 **16 Claims**



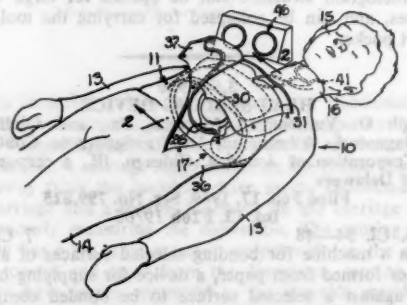
An educational aid viewing apparatus for viewing flash cards provided with educational aid information or rolls of tape provided with educational aid information. The flash cards and rolls of tape have problems, questions, words and the like on the rear faces thereof, and solutions, answers, and pictures corresponding to said problems, questions, and words on the rear faces thereof in a position adjacent to the problems, questions, words and the like. The flash cards and the rolls of tapes are mounted at one end of a platform in a position spaced apart from a pair of inclined mirrors. The mirrors may each be pivotally mounted, or one mirror may be fixed and the other mirror pivotally mounted. The flash cards and the rolls of tapes are each movable from an inoperative position to an operative inclined position in front of the pair of inclined mirrors so that the problems, questions, or words are viewable in the mirrors when the mirrors are in a first position and not viewable in the mirors when one or more of the mirrors is pivoted to an inoperative position.

3,562,924
TRAINING MANIKIN FOR TEACHING AND PRACTICING MOUTH-TO-MOUTH RESUSCITATION
Walter P. Baermann and Vincent M. Foote, Raleigh, N.C., assignors to Medical Supply Company, Rockford, Ill., a corporation of Missouri
Filed Mar. 3, 1969, Ser. No. 803,806
Int. Cl. G09b *23/28*
U.S. Cl. 35—17 **12 Claims**



The manikin comprises a life-like human head joined to the neck of a simulated human torso for realistic universal turning and tilting by a ball-and-socket connection, the head including a mouth which is connected by an air passage to a bag simulating a lung and adapted to be inflated when a trainee breathes into the mouth of the manikin. When the head is tilted forwardly, the air passage is pinched off and obstructed to prevent inflation of the bag such that the manikin simulates a human victim with a blocked windpipe. By lifting the neck and tilting the head rearwardly, the passage may be opened to permit inflation of the bag.

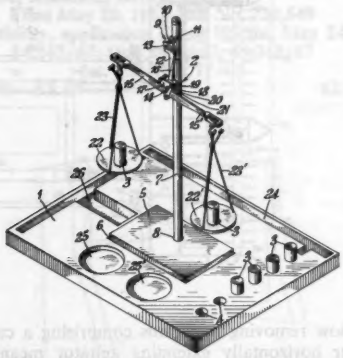
3,562,925
TRAINING MANIKIN FOR TEACHING AND PRACTICING EXTERNAL CARDIAC COMPRESSION
Walter P. Baermann and Vincent M. Foote, Raleigh, N.C., assignors to Medical Supply Company, Rockford, Ill., a corporation of Missouri
Filed Mar. 3, 1969, Ser. No. 803,608
Int. Cl. G09b *23/28*
U.S. Cl. 35—17 **9 Claims**



The manikin comprises a simulated human torso with a chest cavity in which is located an anatomically correct

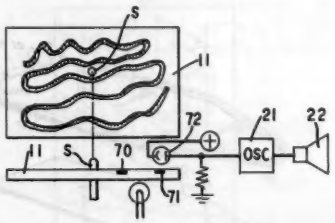
thorax unit covered by a human-shaped chest plate and adapted to be compressed externally to pump blood-like liquid from a simulated heart into a simulated circulatory system.

3,562,926
SELF-CORRECTIVE EDUCATIONAL DEVICE FOR TEACHING DENSITY
Jerry N. Koral, 34 Duke Drive, Stamford, Conn. 06905
Filed Apr. 11, 1968, Ser. No. 720,565
Int. Cl. G09b *23/06*
U.S. Cl. 35—19 6 Claims



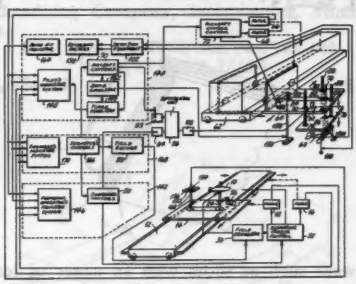
A scientific educational device for teaching preschool children the concept of density. The device consists of a balance, a set of equal sized solid objects of different density, such as equal sized bars of different metals, and a base board containing a set of spaces for the solid objects. The undersides of the objects and the spaces on the board are coded so that they will match only if the objects are placed in the spaces in the order of their densities. The coding enables the child to tell by himself whether he has correctly determined the order of the densities.

3,562,927
VISUAL EDUCATION DEVICE
William Moskowitz, Somerville, N.J., assignor to Multisensory Systems, Somerville, N.J., a partnership of New Jersey
Filed Oct. 30, 1967, Ser. No. 679,078
Int. Cl. G09b *19/00*
U.S. Cl. 35—22 1 Claim



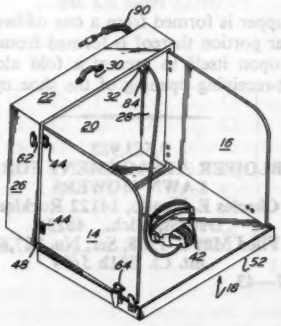
Tracks are provided in a sheet included in an audio circuit. A user employs a stylus to follow a track and the audio circuit emits a sound each time the stylus strays from the track. A plurality of embodiments are described where motion is imparted to the tracks.

3,562,928
TRAINING SYSTEM
Otto H. Schmitt, Port Washington, N.Y., assignor to the United States of America as represented by the Secretary of the Navy
Filed Aug. 7, 1944, Ser. No. 548,487
Int. Cl. G09b *9/00*
U.S. Cl. 35—25 7 Claims



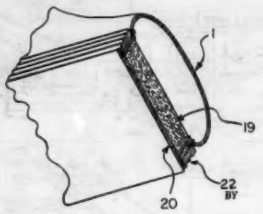
1. In a system for training military personnel in the tactical use of target detection equipment, a device simulating a miniaturized seacraft to be hunted and comprising a plurality of coils and means generating relatively discrete magnetic fields in said coils, first apparatus for mounting said device and operable to cause said device to travel about in a plane area of limited size, means simulating a miniaturized attacking aircraft and comprising pickup coils influenced by said magnetic fields, second apparatus for mounting said means adjacent said first apparatus and operable to cause said means to travel about in a zone substantially parallel to said plane area, two sets of independently operable control mechanisms for selectively operating said first and second apparatus, and electrical means associated with said pickup coils to indicate the position of said pickup coils within said zone.

3,562,929
ISOLATION BOOTH
John H. Emore, Jr., 101 Church St., Ambler, Pa. 19002
Filed July 25, 1968, Ser. No. 747,641
Int. Cl. A47b *41/00*
U.S. Cl. 35—60 3 Claims



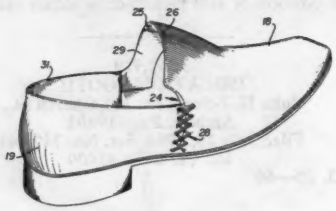
An isolation booth usable in the teaching arts comprising a rear section and a pair of side panels pivotable into the rear section for storage. A desk panel is pivotable up against the rear section. The desk panel and side partitions are pivotable outwardly and secured in place to form a carrell or isolation booth. The entire structure is portable.

3,562,930
FOOTWEAR
Curt E. Kaufman, Waynesville, N.C., assignor to Ro-Search Incorporated, Waynesville, N.C., a corporation of North Carolina
Original application Jan. 14, 1966, Ser. No. 521,247, now Patent No. 3,473,178, dated Oct. 21, 1969. Divided and this application Jan. 27, 1969, Ser. No. 794,333
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 1 Claim



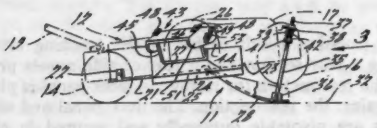
Footwear such as shoes with an upper of leather or similar material and a sole of porous elastomer has according to the invention a welt of highly compressible elastomeric material stitched to the lower margin of the upper and a sole of preferably the same porous elastomer is secured to the welt and upper. A thin tread sole of non-porous material might cover the outside of the sole. Preferably, the welt surrounds the sole and the latter is secured both to the welt and to the tread sole.

3,562,931
SHOE UPPER
Kyriakos Karygiannis, 463 Grace St., Toronto, Ontario, Canada
Filed Apr. 22, 1969, Ser. No. 818,243
Int. Cl. A43b *23/02*
U.S. Cl. 36—45 4 Claims



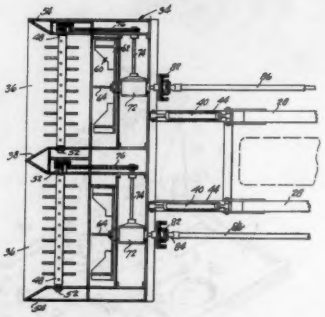
A shoe upper is formed from a one or two piece blank and the rear portion thereof is formed from leather doubled over upon itself to present a fold along the edge of the foot-receiving opening of the shoe upper.

3,562,932
SNOW BLOWER ATTACHMENT FOR ROTARY LAWN MOWERS
Charles E. Rautio, 14122 Rockland, Detroit, Mich. 48239
Filed May 8, 1968, Ser. No. 727,622
Int. Cl. E01h *5/09*
U.S. Cl. 37—43 5 Claims



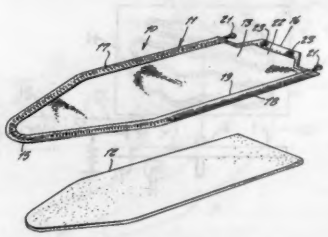
A snow blower attachment adapted to convert a conventional, rotary type lawn mower into a snow blower. The attachment effects this conversion without necessitating removal of the conventional grass cutting blade and is adapted to a wide variety of mowers.

3,562,933
ROTARY SNOW REMOVING MACHINE
Elvin E. Hanneman and Ervin F. Hanneman, both of Rte. 3, Cresco, Iowa 52136
Filed Oct. 4, 1968, Ser. No. 765,045
Int. Cl. E01h *5/09*
U.S. Cl. 37—43 3 Claims



A snow removing apparatus comprising a casing with a lower horizontally extending agitator means and an upper horizontally extending agitator means for biting and cutting into the snow. Blower means are provided for discharging the snow after the agitator means has cut into it. The blower means and the agitator means are provided with shaft drive means extending alongside of opposite sides of a propelling vehicle. The propelling vehicle is provided with a take-off drive means adjacent the rear portion thereof for connecting to the shaft means. The apparatus also is provided with means for attaching it to a tractor or other propelling vehicle and is further provided with hydraulic means for raising and lowering the casing means and the blower and agitator means disposed within the casing so as to cut into banks of snow of varying heights.

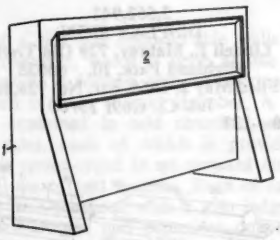
3,562,934
IRONING BOARD COVER
Opal C. Cogar, 10408 Briggs Road, Cleveland, Ohio 44111
Filed July 10, 1969, Ser. No. 840,697
Int. Cl. D06f *81/14, 83/00*
U.S. Cl. 38—140 3 Claims



An ironing board cover with side edges, a tapered end and an opposite butt-shaped end; a peripheral pocket along the tapered and side edges terminating at the butt end, a coil spring member within the pocket with its ends extensible from the ends of the pocket, the butt end of

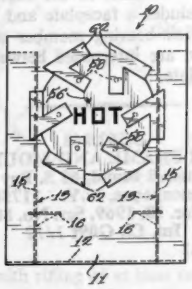
the cover having a tab adapted to be folded under the ironing board, and securement means in the tab and at the ends of the spring adapted for attachment to the underside of the ironing board at the butt end inwardly of the edges thereof, whereby the butt end of the cover is fixedly held to the board and the tapered and side edges of the cover are drawn under the board and resiliently held by the tension in the spring.

3,562,935
DISPLAY DEVICES
Victor M. Collins, Waygill, Burtons Lane, Chalfont St. Giles, Bucks, England, and James K. Smith, 9 Gloucester Close, Rainham, Kent, England
Filed May 20, 1968, Ser. No. 730,549
Claims priority, application Great Britain, May 24, 1967, 24,247/67; Oct. 24, 1967, 48,348/67
Int. Cl. G09f 11/00
U.S. Cl. 40—53 12 Claims



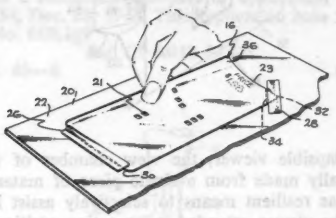
This invention relates to a display device for selectively displaying advertisements or other information in accordance with a predetermined programme and which changes the display material after specific time periods. The device comprises a plurality of display members for carrying the matter to be displayed, transport means for moving any of the display members to and from a display position and preselector means determining the order in which the display members are moved into the display position.

3,562,936
DISPLAY DEVICE
Alois F. Schoenung, Naperville, Ill., assignor to Rapid Mounting and Finishing Company, a corporation of Illinois
Filed May 3, 1968, Ser. No. 726,418
Int. Cl. C09f 11/00
U.S. Cl. 40—61 14 Claims



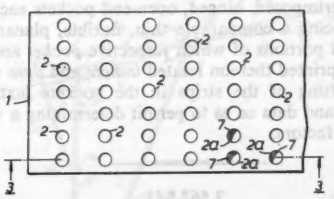
An animated display device in which a plurality of movable small display members are mounted on an oscillating or revolving support; and wherein a single actuating member synchronously moves all of the small display members relative to a large display member in response to the oscillatory or rotary input, so as to alternately cover and uncover part or all of the display material on the large member.

3,562,937
INVENTORY CONTROL APPARATUS
Herbert N. Sandel, Los Angeles, Calif., assignor to Rapid Merchandising Company, Incorporated, Minneapolis, Minn.
Filed Sept. 23, 1968, Ser. No. 761,440
Int. Cl. G09f 3/18
U.S. Cl. 40—10 5 Claims



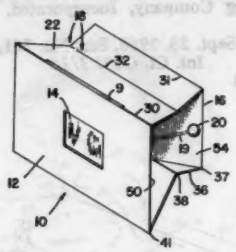
Apparatus for facilitating inventory control of record albums by attaching an "IBM" card in a manner resisting accidental removal but enabling clean intentional removal. The apparatus comprises a pair of tape strips, one with light tack adhesive that fastens one end of the card to the album cover, and the other of high tack adhesive that permanently fastens an opposite corner of the card to the album cover. The IBM card has a perforation along the permanently fastened corner to enable the card to be neatly torn away.

3,562,938
INFORMATION DISPLAY DEVICES
Hassan Paddy Abdel Salam, London, England, assignor to Universal Telewriters (Pty.) Ltd., Durban, East Natal, Republic of South Africa, a company of South Africa
Filed Sept. 16, 1968, Ser. No. 762,195
Claims priority, application Great Britain, Sept. 27, 1967, 43,992/67
Int. Cl. G09f 11/00
U.S. Cl. 40—28 9 Claims



Information display apparatus includes an opaque member with a matrix of transparent areas. An individual shutter associated with each aperture is movable between two stable positions in which it respectively exposes and occults that aperture. The shutter is moved by electrical means which applies directly to the shutter forces moving it from one to the other of the stable positions. These forces may be electrostatic or electromagnetic.

3,562,939
VIEWER
Justin M. Jacobs, Jr., and Kellogg D. Fleming, San Francisco, Calif., assignors, by direct and mesne assignments, to Justin M. Jacobs, Jr., San Francisco, Calif.
Filed July 18, 1968, Ser. No. 745,737
Int. Cl. G09f *11/30*
U.S. Cl. 40—63 **12 Claims**



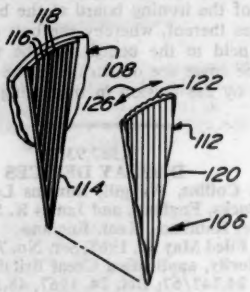
A collapsible viewer, the view chamber of which is substantially made from a single piece of material. The viewer has resilient means to selectively assist in maintaining the viewer extended in operating position or collapsed in storage position.

3,562,940
CALCULATOR
Capron R. Gulbransen, Sr., Wilmette, and Jerre G. Kneip, Barrington, Ill., assignors to Graphic Calculator Company, Barrington, Ill., a corporation of Illinois
Filed Sept. 23, 1968, Ser. No. 761,714
Int. Cl. G09f *11/30*
U.S. Cl. 40—65 **9 Claims**

The essential concept of this invention involves thin, flexible, planar, scored material folded to form a series of superimposed, hinged, open-end pockets each slidably embracing a comparable thin, flexible, planar strip, the exposed portions of which respective *pocket* and *strip* parts have printed thereon related *indicia* and *data* whereby the shifting of the strips in the pockets juxtaposes the indicia and data so as to permit determining a variety of desired factors.

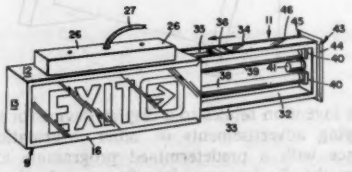
3,562,941
LENTICULATED DISPLAY DEVICE
Edward Boden, Philadelphia, Pa., assignor to Daylight Animation, Inc., Philadelphia, Pa., a corporation of Pennsylvania
Filed July 25, 1968, Ser. No. 747,515
Int. Cl. G09f *13/36*
U.S. Cl. 40—106.53 **4 Claims**

A decalcomania for use with a lenticular sheet in an optically changeable display device comprising a carrier sheet and artwork positioned thereon. Said artwork comprises a plurality of sets of equally spaced parallel lines. Each set of parallel lines will depict a different configuration when positioned behind a lenticular sheet. The carrier sheet for the artwork includes means for securement



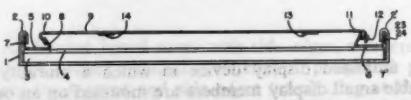
of the sheet and its associated artwork onto a rigid supporting sheet.

3,562,942
DISPLAY SIGN
Lindell E. Mabrey, 729 Old Trail, Highland Park, Ill. 60035
Filed May 2, 1968, Ser. No. 726,085
Int. Cl. G09f *13/00*
U.S. Cl. 40—132 **4 Claims**



A sign includes a box-shaped housing including an integral cabinet having at least one side providing a window for displaying indicia. The cabinet provides a top, bottom and one side of the housing together with a frame for the window. The cabinet also defines one open side to receive a chassis on which is mounted a source of light to illuminate the sign. An electrical receptacle is mounted on the interior of the cabinet; and a mating plug is mounted on the chassis so that the plug disconnects from the receptacle when the chassis is removed from the cabinet. Electrical power is fed to the receptacle and thence to the plug. Wires are routed through a raceway provided in the periphery of the chassis to couple to sockets mounted on opposing sides of the chassis and which receive the fluorescent tubes. A display subassembly is received in a channel in the cabinet adjacent the window; and it includes a faceplate and a diffusion plate behind it. An indicia-bearing member and a color-providing film, if any, are interposed between the faceplate and the diffusion plate.

3,562,943
MIRROR FRAME AND MOUNTING
Harry Russell Brand, 62 S. Bay Drive, Massapequa, N.Y. 11758
Filed Mar. 18, 1969, Ser. No. 808,226
Int. Cl. G09f *1/12*
U.S. Cl. 40—152.1 **3 Claims**

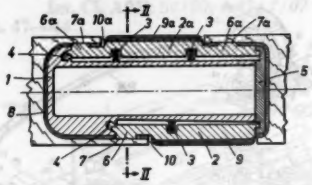


Simple folded metal parts are assembled into improved mirror frame and mounting.

3,562,944
RIFLE WITH DETACHABLE MAGAZINE AND LATCH THEREFOR

Karl Wagner and Horst Wesp, Steyr, Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Mar. 4, 1969, Ser. No. 804,116
Claims priority, application Austria, Apr. 3, 1968, 3,220
Int. Cl. F41c *25/00, 25/02, 25/10*
U.S. Cl. 42—6 6 Claims

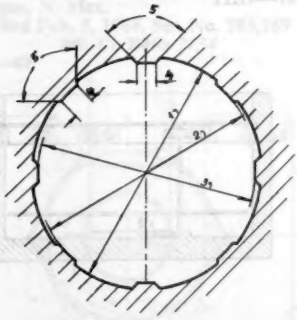


A stock of a rifle has opposite side walls defining a a magazine chamber, which is open at one end. Each of said side walls is formed with an aperture and with a recess which is open to said chamber. A detachable magazine is contained in said chamber and has two longitudinal sides, each of which is provided with a nose, which is spring-urged in an outward direction and engaged with one of said recesses. Each of said longitudinal sides is also provided with a grip ledge, which is spring-urged outwardly and protrudes outwardly from said stock through one of said apertures. Said noses are arranged to disengage said recesses when said grip ledges are depressed into said stock.

3,562,945
GUN BARREL WITH STEPPED RIFLING

Leo David Mikola, Lopentie 10, Riihimaki, Finland

Filed Oct. 14, 1968, Ser. No. 767,225
Claims priority, application Finland, Oct. 17, 1967, 2,778/67
Int. Cl. F41c *21/00*
U.S. Cl. 42—78 5 Claims

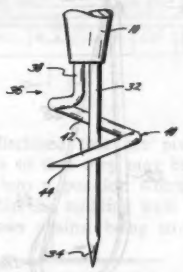


A gun barrel with rifling of at least two different depths which results in a more effective sealing of the propellant gases behind the projectile to impart a greater driving force to the latter, and which also prevents the escape of the hot gases past the projectile which causes the erosion of the barrel with a consequent loss in accuracy, as well as a reduction in the effective service life thereof. The different heights of the lands alternating with the grooves may be obtained in several ways, for example, by forming the barrel of uniform diameter, with the diameters of the land surfaces being different; by the diameter of the land surfaces being uniform with the diameters of the grooves in the barrel varying, or both the diameter of the land surfaces and that of the grooves not being constant.

3,562,946
BARBLESS FISHING SPEAR

Bob J. Spann, Suite 900, Wilson Bldg., Corpus Christi, Tex. 78401

Division of application Ser. No. 814,234, Apr. 4, 1969, now Patent No. 3,482,349, which is a continuation of application Ser. No. 620,817, Mar. 6, 1967, which in turn is a continuation-in-part of application Ser. No. 421,734, Dec. 28, 1964. This application June 24, 1969, Ser. No. 858,219
Int. Cl. A01k *81/04*
U.S. Cl. 43—6 4 Claims

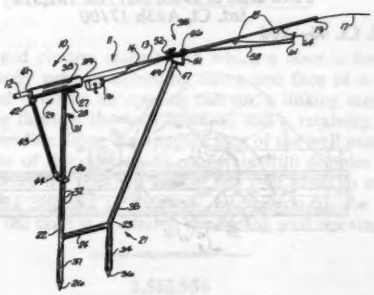


A fishing spear has a first impaling tine joined to one end of an elongated handle. The first tine has a helical portion terminating in a pointed tip. A second tine is essentially straight and extends from the handle through the helical portion of the first tine where it terminates in a pointed tip.

3,562,947
FISHING POLE SUPPORT AND HOOK-SETTING APPARATUS

Johny O. W. Martin, R.F.D. 2, Juniata, Nebr. 68955

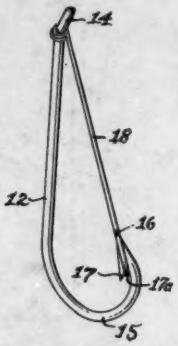
Filed Dec. 3, 1968, Ser. No. 780,642
Int. Cl. A01k *97/00, 97/12*
U.S. Cl. 43—15 7 Claims



A hook-setting apparatus for use with a conventional fishing pole including a fishing pole holder pivotally mounted to a support frame and operable to swing the holder and attached fishing pole in a vertical plane. A

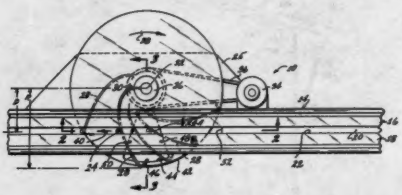
spring is connected at one end to the holder and adjustably mounted on the other end to the support frame to bias the holder to a vertical position. An enclosure frame having a pivotable constraining bar is positioned forward of the holder on the support frame to hold the pole in a horizontal position. The bar is held in constraining position by an activating lever pivoted on the enclosure frame. The fishing line is engaged with the lever and when a fish pulls on the line the lever is disengaged from the constraining bar and the pole is swung to a vertical position by the spring to set the hook in the mouth of the fish.

3,562,948
WEEDLESS FISH HOOK
Mona Santo and Michael W. Santo III, both of 47 Lake Drive, Roosevelt, N.J. 08555
Filed July 12, 1968, Ser. No. 744,589
Int. Cl. A01k *83/00*
U.S. Cl. 43—43.4 **13 Claims**



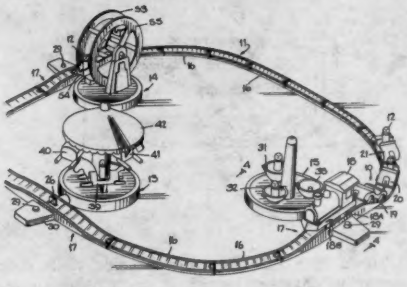
A fish hook having the point shielded by a resilient guard member looped over the barb at the pointed end of the hook, and extended to and looped through the hook eye or over a barb adjacent the hook eye to preclude snagging of the hook when drawn through weeds and the like.

3,562,949
TOY VEHICLE AND APPARATUS FOR MOVING THE VEHICLE–IV
Janos Beny, Manhattan Beach, Thomas E. See, Huntington Beach, and Arthur S. Woodward, Sylmar, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 5, 1968, Ser. No. 781,374
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **3 Claims**



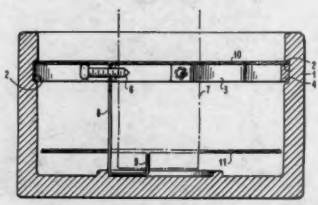
Toy vehicle and apparatus for propelling the unpowered vehicle so it can then coast around a track, comprising a track section with a slot therein and a rotating spiral member for sweeping along the slot at every revolution. The vehicle has a projection that enters the slot so the spiral member can engage the vehicle to propel it.

3,562,950
TRACK, TRAIN AND AMUSEMENT ACCESSORY MEANS DRIVEN BY SAID TRAIN
Robert Genin, Scarsdale, N.Y., assignor to Child Guidance Toys Inc., Bronx, N.Y., a corporation of New York
Filed Apr. 28, 1967, Ser. No. 634,693
Int. Cl. A63h *33/26, 21/00*
U.S. Cl. 46—243 **8 Claims**



An amusement park complex in which toy dolls are conveyed as passengers on a railroad train to a series of stations along the trackway, the train being caused to stop automatically at each station to permit the transfer of passengers to a ferris wheel or other amusement device located at the station, which amusement device is driven through a transmission coupling by the engine of the train whose wheels continue to turn even though movement of the train is arrested.

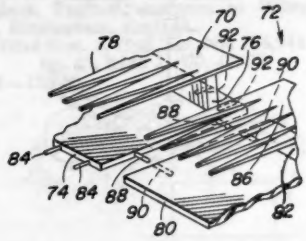
3,562,951
CHRISTMAS TREE STAND WITH WATER CONTAINER
Kurt Schwaderlapp, Baumbach, Westerwald, and Anton Schoplocher, Ransbach-Baumbach, Germany, assignors to Jasba-Keramikfabriken, Jakob Schwaderlapp K.G., Baumbach, Germany, a corporation of Germany
Filed Mar. 14, 1969, Ser. No. 807,182
Claims priority, application Germany, Mar. 15, 1968, P 17 53 127.0
Int. Cl. A47g *33/12, 7/07*
U.S. Cl. 47—41.11 **9 Claims**



Christmas tree stand and water container includes upper insert means for holding a tree, the upper insert means being disposed in the water container and including locking means at the wall of the container, a springy wave-shaped band disposed about the inner periphery of the container wall and formed with radially inwardly directed bows having threaded openings substantially at the apices thereof, and holding screws threaded in the openings and tightenable against a tree inserted therebetween,

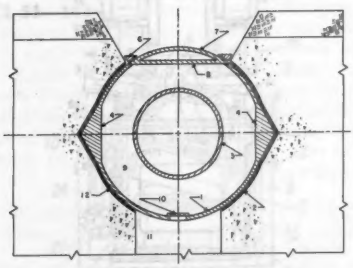
the band being formed with radially outwardly directed bows cooperably engaging the locking means for locking the band in the container when the holding screws are tightened against a tree.

3,562,952
PLANT ANCHOR
Pietro O. Bramante, 1112 Wenonah Ave., Oak Park, Ill. 60304
Filed July 22, 1968, Ser. No. 746,377
Int. Cl. A01k *64/00*; A47g *7/07*
U.S. Cl. 47—44 **5 Claims**



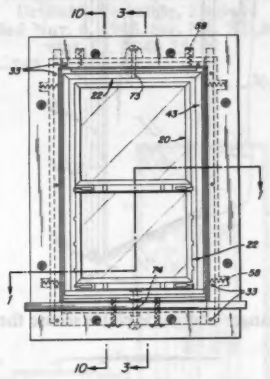
A device which facilitates the planting of plants in aquariums and the like includes a plant holder comprising a plurality of generally horizontal members interconnected at one end, with the other end thereof being open so as to define a plurality of stem retaining slots; and means, such as a relatively wide, generally flat base designed for positioning on the aquarium bottom and an upwardly projecting riser member, for positioning the plant holder in a generally horizontal plane parallel to but spaced apart from the aquarium bottom. Plant stems may be securely placed in the stem retaining slots, and the entire device covered with a layer of gravel so that only the plant stems remain visible.

3,562,953
HARDENED CLOSURE-SYSTEM FOR UNDERGROUND STRUCTURES
Donald I. Prickett, 2600 Pajarito Road SW. 87105; James T. Posey, 714 Parkland Circle SE. 87108; William H. Stephens, 4901 Sunningdale NE. 87110; and Fred A. Gross, Jr., 2916 Chama NE. 87110, all of Albuquerque, N. Mex.
Filed Feb. 5, 1968, Ser. No. 703,169
Int. Cl. E06b *3/34*
U.S. Cl. 49—40 **1 Claim**



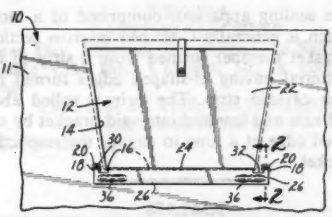
This invention relates to a rotating spherical shell door for hardened underground structures. It provides for debris removal by explosive propulsion of a cap on the sphere and collection of any debris fall back inside the shell. The shell can then be rotated for egress or ingress through a cylinder in the spherical structure.

3,562,954
PIVOTALLY SUPPORTED WINDOWS
John B. Duguay, 37 Garand St., Waterville, Maine 04901
Filed Aug. 21, 1968, Ser. No. 754,394
Int. Cl. E06b *7/20*
U.S. Cl. 49—318 **5 Claims**



Windows are disclosed that are pivotally supported by casing structure so that they may be swung to bring their outer faces into a position wherein they may be serviced from within the building with releasable means holding the windows against being so turned.

3,562,955
HINGED CLOSURE ASSEMBLY
Jack P. Blomgren, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware
Filed May 1, 1969, Ser. No. 820,916
Int. Cl. E05d *7/00*
U.S. Cl. 49—397 **2 Claims**

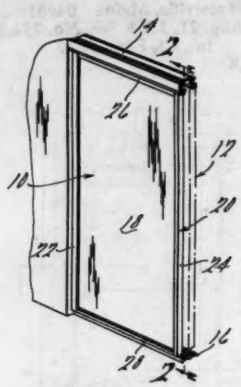


A hinged closure assembly in which a door is formed with a body portion extending along one face of a wall panel and covering an opening therein, a linking segment extending through the wall opening, and a retaining segment extending along the opposed face of the wall panel to both sides of the opening to cooperate with dimples protruding from the opposed face of the wall panel to retain the linking segment of the door in position on the wall panel as the door is opened to expose the wall opening.

3,562,956
SLIDING DOOR FRAME
Leonard E. Johnson, Jr., 7 Susquehanna, Elkhart, Ind. 46514
Filed Nov. 19, 1969, Ser. No. 878,152
Int. Cl. E05d *13/02*
U.S. Cl. 49—411 **3 Claims**

A sliding door frame having open, rectangular cross section stiles and rails for resiliently holding a door panel

in place in the frame and brackets with spaced channel portions disposed within the stiles and rails which together



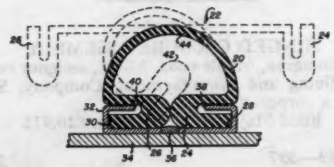
with corner hanger and guide plates secure the stiles to the rails.

3,562,957

CLOSURE SEALING APPARATUS

Robert L. Landis, Los Altos Hills, Calif., assignor to The Landis Sales Company, Los Altos Hills, Calif., a corporation of California

Filed Feb. 26, 1969, Ser. No. 802,401
Int. Cl. E06b 7/16
U.S. Cl. 49—493 **5 Claims**



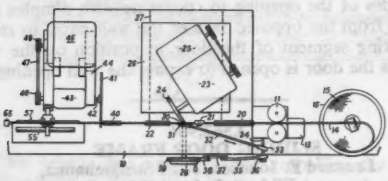
A closure sealing apparatus comprised of a mounting bracket which is generally C-shaped in cross section and a flexible gasket member formed from a strip of flexible resilient material having U-shaped edges turned normal to the plane of said strip. The strip is rolled about its longitudinal axis and inserted into said bracket by causing one U-shaped edge at a time to engage the respective lips of said bracket.

3,562,958

MACHINE FOR MAKING CUTTING BLADES

Francis William Martin and Frederick Charles Wilcox, Andover, England, assignors to AMF Incorporated, New York, N.Y., a corporation of New Jersey

Filed Feb. 4, 1969, Ser. No. 796,515
Int. Cl. B24b 7/00, 9/00
U.S. Cl. 51—3 **16 Claims**



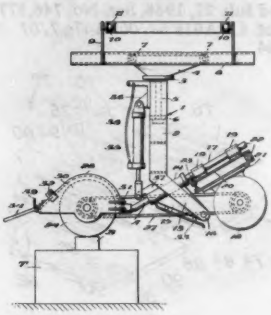
A machine having a first grinding wheel for providing a cutting edge on strip steel and a second grinding wheel for parting off a predetermined length of strip having said cutting edge.

3,562,959

MANUAL SNAGGING GRINDERS

Peter C. Dooley, Jr., Lewiston, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y., a corporation of Delaware

Filed Nov. 20, 1968, Ser. No. 777,319
Int. Cl. B24b 7/00
U.S. Cl. 51—47 **10 Claims**



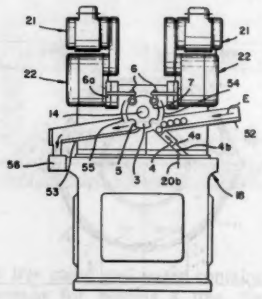
A manual snagging grinder suspended in a position to locate the wheel over the work, such as a billet, and to remove surface material therefrom. The grinding wheel is supported on a frame for vertical swinging motion and for horizontal rocking motion. The vertical motion is controlled by power means, such as a pneumatic cylinder. The rocking motion is on an axis substantially through the point of contact of the grinding wheel with the work.

3,562,960

APPARATUS FOR THE GRINDING, HONING AND ABRASIVE FINISHING OF ANNULAR WORKPIECES, ESPECIALLY BEARING RINGS

Ernst Thielenhaus, Wuppertal-Elberfeld, Germany, assignor to Maschinenfabrik Ernst Thielenhaus, Wuppertal-Barmen, Germany, a corporation of Germany

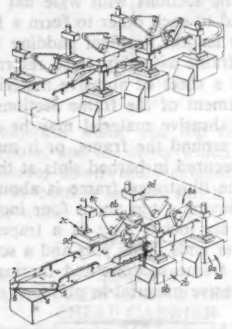
Continuation-in-part of application Ser. No. 810,529, Mar. 26, 1969. This application June 4, 1969, Ser. No. 830,264
Claims priority, application Germany, June 8, 1968, P 17 52 064.1
Int. Cl. B24b 7/00
U.S. Cl. 51—58 **10 Claims**



An apparatus for the grinding, honing or abrasive finishing of bearing rings in which a turret or magazine is provided with a plurality of angularly equispaced outwardly open pockets. The workpieces are fed to the pockets in succession and are swung by the turret disk into

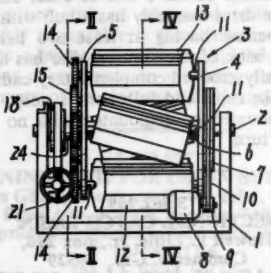
at least two working positions before being released at a discharge station. Each of the working stations includes a drive spindle adapted to bear against one face of the workpiece while the other face thereof is engaged by a freely rotating sleeve combined with a fluid-centering arrangement which is axially thrust into the interior of the ring-shaped body. A shaping tool engages the outer periphery of the ring.

3,562,961
POLISHING MACHINE
Kenneth Hubert Clayson, Solihull, and David John Smith, Birmingham, England, assignors to Wilmot-Breeden Limited, Birmingham, England
Filed Sept. 3, 1968, Ser. No. 756,941
Int. Cl. B24b *21/00, 49/00*
U.S. Cl. 51—138 9 Claims



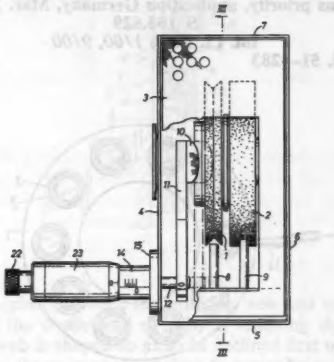
Control means for selectively controlling the pressure between a polishing head and a contoured object, in accordance with the surface zone being polished. The control means comprise position responsive means which produce an electrical position signal as the polishing head traverses each boundary between adjacent surface zones, a sequence control circuit to which the succession of position signals are fed and which delivers output signals in sequences as each position signal is received, and a pressure controlling device which acts to control the polishing pressure selectively in accordance with the prevailing output signal.

3,562,962
GRINDING APPARATUS
Ietatsu Ohno, 14–2–406 Mure, Mitaka, Tokyo, Japan
Filed Feb. 26, 1969, Ser. No. 802,369
Int. Cl. B24b *31/02;* B01f *9/00*
U.S. Cl. 51—163 2 Claims



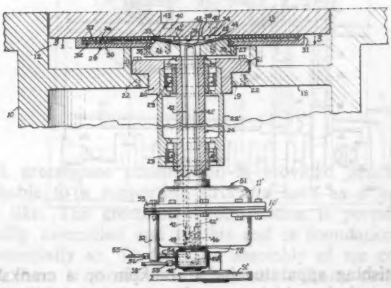
This invention is a grinding apparatus wherein on a revolving drum is mounted a container eccentrically at both ends on each shaft parallel with the shaft of said drum so that a flow in the form of the figure 8 may be given to abrasives and objects to be ground contained in said container.

3,562,963
OPTICAL LENSE GRINDING MACHINES
Stanley Wrigglesworth, "The Firs," Spellowgate, Driffield, Yorkshire, England
Filed Nov. 6, 1968, Ser. No. 773,863
Int. Cl. B24b *55/00*
U.S. Cl. 51—262 3 Claims



A device, for use with optical lens edge grinding machines having a V-groove grinding wheel, such that the lens being ground may be deflected to controlled extent and the apex of the bevel formed on the lens edge off-set, and mechanism for effecting controlled displacement of the deflecting element which may be moved into an inoperative position when not required.

3,562,964
LAPPING MACHINE
Lawrence Day, Chicago, Ill., assignor to Spitfire Tool & Machine Co., Inc., Chicago, Ill., a corporation of Illinois
Filed Feb. 24, 1970, Ser. No. 13,339
Int. Cl. B24b *55/02*
U.S. Cl. 51—266 6 Claims



A lapping machine having a horizontally rotatable relatively flat lapping plate in facial contact with a relatively flat spirally wound tubular coil arranged therebeneath and through which a coolant circulates to maintain through-

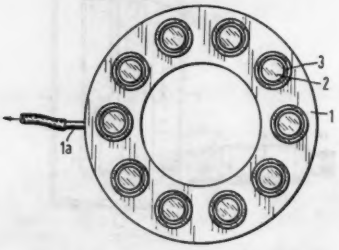
out a lapping operation a uniform temperature of the lapping plate and a pressure plate therein and of the work disposed upon the lapping plate beneath the pressure plate.

3,562,965

METHOD AND APPARATUS FOR PREPARING A PLURALITY OF DISC-SHAPED SEMICONDUCTOR CRYSTALS FOR SIMULTANEOUS WORKING BY A TOOL

Herbert Lange, Ubersee (Chiemsee), Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 26, 1967, Ser. No. 693,645
Claims priority, application Germany, Mar. 3, 1967, S 108,629
Int. Cl. B24b *1/00, 9/00*
U.S. Cl. 51—283 1 Claim



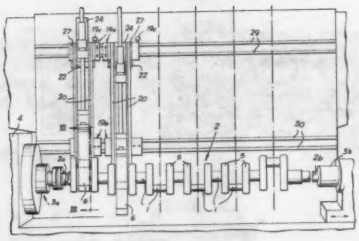
A plurality of disc-shaped semiconductor crystals are cemented at a second surface of each to a carrier at distances from the carrier which coplanarly position the first surfaces of the crystals in a manner whereby the plane of the first surfaces and the working surface of the tool are coincident.

3,562,966

CRANKPIN FINISHING APPARATUS

Rudolf Schwär, Neviges, Germany, assignor to Maschinenfabrik Ernst Thielenhaus, Wuppertal-Barmen, Germany, a corporation of Germany

Filed July 15, 1968, Ser. No. 745,025
Claims priority, application Germany, July 15, 1967, M 74,766
Int. Cl. B24b *9/02, 19/00*
U.S. Cl. 51—347 9 Claims



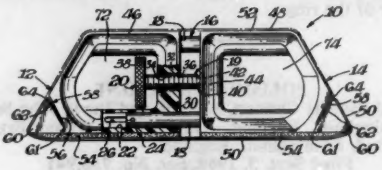
A finishing apparatus for a crankpin on a crankshaft includes a lathe which turns the crankshaft while three angularly spaced finishing stones carried by racks in a movable housing engage the surface of the crankpin. Gear trains between the racks positively couple the stones together for joint movement and maintain them at an equal distance from a point fixed in relation to the housing to round the crankpin while finishing it.

3,562,967

SANDING DEVICE

Paul A. Eriksen, 5 Cleveland Ave., McDaniel Heights, Wilmington, Del. 19803

Filed Jan. 28, 1969, Ser. No. 794,725
Int. Cl. B24d *15/00*
U.S. Cl. 51—372 18 Claims



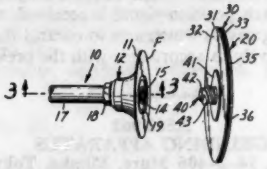
A pair of frame sections with wide flat rims are adjustably connected to each other to form a frame assembly of adjustable length. Resilient padding is secured to one side of the frame assembly (also referred to herein as a frame) and a sheet of abrasive material is secured thereto by adjustment of the frame sections apart from each other. The abrasive material may be a continuous belt all the way around the frame, or it may be a strip whose ends are secured in barbed slots at the outer ends of the frame. The illustrated frame is about two inches wide and deep, having a top about four inches long and a bottom about six inches long in a trapezoidal shape with pointed lower ends. Slide pins and a screw are used for coupling the frame sections and forcing them apart to secure the abrasive material in place.

3,562,968

SURFACE TREATING TOOL

Howard E. Johnson, St. Paul, Arlie M. Knutson, Oakdale, and Vince Meyer, South St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware

Filed Mar. 12, 1969, Ser. No. 806,422
Int. Cl. B24d *17/00*
U.S. Cl. 51—389 7 Claims



A rotary surface treating tool having a drive assembly and a quick change abrasive disc or other surface treating device. The drive assembly has a hub with a cylindrical central opening having at least two helical ridged cams, and the back of the abrasive disc has a drive button with helically grooved complementary cam followers. The pitch of the cams and followers is steep, so that the disc can be mounted or demounted with no more than about one half turn.

3,562,969

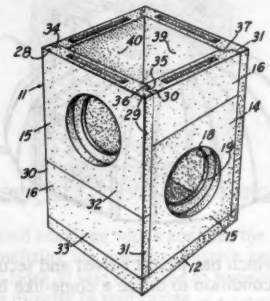
SECTIONAL CATCH BASIN

Howell P. Little, Jr., Box 296, Commerce, Ga. 30529

Filed Oct. 22, 1968, Ser. No. 769,517
Int. Cl. E02d *29/12*
U.S. Cl. 52—20 2 Claims

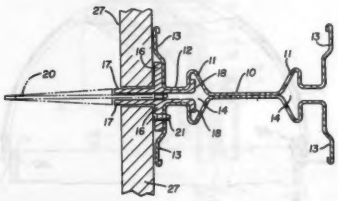
A sectional catch basin comprising pre-cast interfitting walls bases and covers. Each base and the cover can be various heights to meet the requirement of individual

situations. Each base includes a groove in its upper surface along each edge, and each wall section includes a tongue protruding from its lower edge, which fits into the groove of the base. The upwardly extending edges of each wall include flanges and grooves which fit with the flanges and



grooves of adjacent walls. The top edge of each wall includes a groove, and the cover which closes the top of the basin includes downwardly extending tongues along the edges of its bottom surface which protrude into the grooves of the walls.

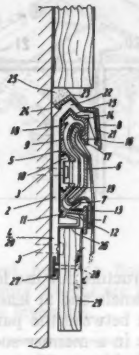
3,562,970
METAL STUDDING AND ADJUSTABLE SHELF CARRIER
Paul Schwartz, 249 Brainard Drive, Youngstown, Ohio 44512
Filed May 21, 1969, Ser. No. 826,427
Int. Cl. A47b *57/06;* E04c *3/32*
U.S. Cl. 52—36 **3 Claims**



A metal studding having a cross-sectional configuration defining an elongated channel in each of its opposite sides with each of the channels having a narrowed mouth portion together with an elongated section of a metal shape slidably engageable in the channels of the studding so as to be adjustable longitudinally thereof, the metal shape having a configuration providing for the reception and attachment of an elongated shelf-supporting arm.

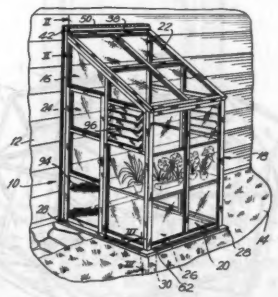
3,562,971
JOINING STRIP FOR USE IN BUILDING
Klaus Göbel, Zeughausstr. 41, Trier, Germany
Filed Aug. 2, 1968, Ser. No. 749,788
Claims priority, application Germany, Aug. 4, 1967, P 16 59 311.6
Int. Cl. E04d *13/14*
U.S. Cl. 52—60 **6 Claims**

At the junction between a flat roof and a wall extending upwardly from such roof, an upturned edge of roof covering, such as the roof skin or flashing overlapping the roof skin, is secured in place by attaching means including a connecting strip having a main web mounted in a plane parallel to the upright wall face, a masking web projecting outwardly from the upper edge of the main web and a flange projecting outwardly from the lower edge of the main web. The roof covering edge



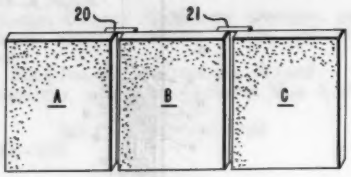
is held in place between the masking web and the lower flange of the connecting strip by a retaining strip. The masking web is shaped so as to be inclined first upwardly away from the main web and then downwardly away from the main web to constitute a rain backwash-preventing profile.

3,562,972
GREENHOUSE CONSTRUCTION
Cyrus D'Amato, 8 Parkway Drive, Roslyn Heights, N.Y. 11577
Filed Apr. 17, 1969, Ser. No. 816,950
Int. Cl. A01g *9/16;* E06b *7/14, 3/58*
U.S. Cl. 52—66 **6 Claims**



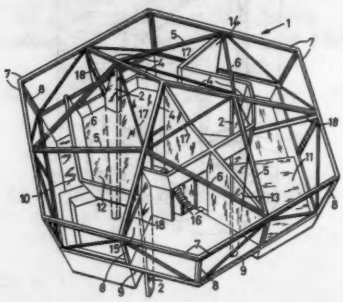
A greenhouse construction is provided which is attachable to a supporting structure such as a house or the like. The greenhouse construction is portable and readily assembled and to this end is foundationless or substantially so. To facilitate assembly of the construction there is provided a demountable framework which is received by expansion-type receptacles which accommodate deviations from proper alignment and which furthermore accommodate expansion and contraction due to changes in temperature and so forth. A particular design is provided for the framework members such that glass panes can be readily mounted at the place of final assembly.

3,562,973
COLLAPSIBLE PREFABRICATED STRUCTURE
Carl E. Gangemi, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware
Filed Feb. 14, 1969, Ser. No. 799,417
Int. Cl. E04b *1/344;* E04c *2/40*
U.S. Cl. 52—71 9 Claims



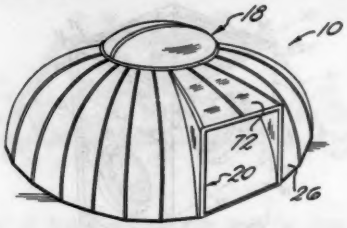
A collapsible structure for use in construction comprising at least two panels and at least one elastomeric strip, bridging the seam between the panels and bonded to the rear of the panels in a manner such that the strips function as elastomeric hinges. These hinges are designed so that they will stretch to allow the panels to be positioned in any angular relation to one another, and contract when the panels are finally positioned, to insure that the front surfaces of the panels are contiguous. When the panels, elastomeric strips and bonds are water resistant, the hinge acts as a seal and the structure is useful as a prefabricated bathtub surround package.

3,562,974
STRUCTURAL UNIT
Heinrich Niemeyer, Tubingen, Germany, assignor to Wilhelm Schilling, Weiskirchen, Germany
Filed Aug. 25, 1969, Ser. No. 852,540
Claims priority, application Germany, Aug. 29, 1968, P 17 84 632.1
Int. Cl. E04b *1/34;* E04h *1/00*
U.S. Cl. 52—73 9 Claims



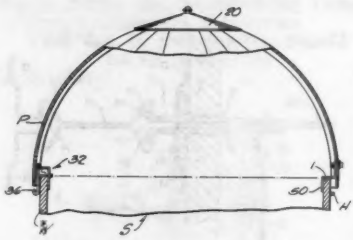
To provide a structural unit for a transportable house, three vertical support beams forming a triangle support a stable structural framework which includes a roof structure and a plurality of side wall supporting beams extending in vertical planes from horizontal struts of the roof structure. The roof structure comprises three obliquely extending main roof supporting trusses supported on the support beams, and the struts which extend circumferentially and have their ends interconnected. The struts are adjacent the outer ends of the trusses and extend transversely thereto.

3,562,975
PREFABRICATED SHELTER AND METHOD OF ERECTING SAME
Charles W. Moss, 2833 Stommel Road, Ypsilanti, Mich. 48197
Filed Jan. 14, 1969, Ser. No. 790,930
Int. Cl. E04b *1/32;* E04h *1/02*
U.S. Cl. 52—80 7 Claims



A shelter which has panels bowed and secured together in a stressed condition to define a dome-like building. The panels are retained in the stressed condition by supporting structure, and the stressed condition of the panels cooperates in locking the assembled parts together. A flexible joint is provided between the panels to aid in erecting and in retaining the structure together and to provide a weather seal. A method whereby the shelter can be erected by stressing the panels in sequence is provided.

3,562,976
ROOF CONSTRUCTION FOR SILOS OR THE LIKE
Roger W. Wollin, Lake Mills, and Larry L. Smiley, Wausau, Wis., assignors to Fiberdome Incorporated, Lake Mills, Wis., a corporation of Wisconsin
Filed Mar. 3, 1969, Ser. No. 803,541
Int. Cl. E04b *7/08;* E04h *7/30*
U.S. Cl. 52—81 10 Claims

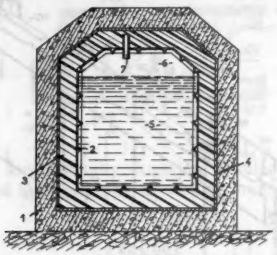


A generally dome shaped roof for silos or the like and fabricated from individual panels which are fastened together. The panels are adjustable relative to one another to accommodate silos or buildings of various diameters. The joints between the panels are constructed so as to be waterproof. Bracket means for holding the roof down tightly on the top of the silo and also tightly against the outside of the silo.

3,562,977
PRESSURE FLUID STORAGE TANK WITH AN INNER MEMBRANE-LIKE ENVELOPE
Jean Alleaume, Saint-Cloud, France, assignor to Technigaz, Paris, Seine, France, a company of France
Filed Aug. 8, 1968, Ser. No. 751,106
Claims priority, application France, July 11, 1968, 158,885
Int. Cl. E04b *1/32;* B65d *25/18, 7/22*
U.S. Cl. 52—82 2 Claims

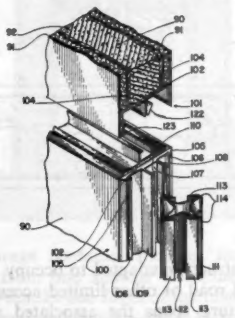
A pressure tank for storing an at least partially liquid fluid comprising an outer casing of self-supporting structure, an inner impervious, metallic, thin-walled, fluid-confining, membrane-like envelope carried by heat-insulating

materials filling the intermediate space left between said envelope and casing, and open-ended duct means extending through the envelope wall for permanently interconnecting said intermediate space and that portion of the



space inside said envelope which contains the fluid gaseous phase for equalizing the pressures therein applied to both opposite wall sides of said envelope to transfer the gaseous fluid pressure directly to said casing.

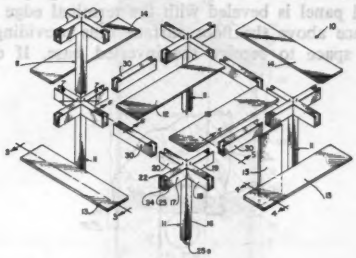
3,562,978
BUILDING CONSTRUCTION
Ewgeni Ali-Oglu, Cambridge, Mass., assignor to Componoform, Inc., Cambridge, Mass.
Continuation of application Ser. No. 527,450, Feb. 15, 1966. This application Oct. 10, 1968, Ser. No. 781,671
Claims priority, application Great Britain, Feb. 16, 1965, 6,705/65
Int. Cl. E04b *1/04*; E04c *1/10*
U.S. Cl. 52—122 **12 Claims**



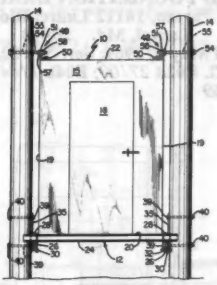
A building construction comprising modular cross arm columns, floor slabs, building slabs and related structures is provided. The wall panels which may be used as interior wall panels have at least one side edge carrying an elongated fastening means for interlocking with an edge of an adjacent wall panel and for preventing movement of such interlocked panels directly away from each other while permitting sliding of said panels along a line fixed with respect to each other and substantially parallel to the one side edge. The fastening means comprises hook means for positively preventing movement of two interlocked panels directly away from each other without first destroying the hook means.

3,562,979
BUILDING CONSTRUCTION
Ewgeni Ali-Oglu, Cambridge, Mass., assignor to Componoform, Inc., Cambridge, Mass.
Continuation of application Ser. No. 677,195, Oct. 23, 1967. This application Dec. 16, 1968, Ser. No. 808,033
Int. Cl. E04c *3/34*; E04b *1/04, 5/04*
U.S. Cl. 52—125 **29 Claims**

A building construction in modular form is provided for use in homes, schools, offices and other structures. Prefabricated or precast columns having integral cross arms are key components in the structure of this invention. In addition, novel modular floor slabs, exterior panels and concrete coring devices are provided in building constructions of this invention.



3,562,980
POLE-MOUNTED UTILITY BUILDING
Frank Christian Walz, Jr., Golden, and Jerry B. Davis, Lakewood, Colo., assignors, by mesne assignments, to Levingston-Armadillo, Inc., Denver, Colo., a corporation of Delaware
Continuation of application Ser. No. 641,040, May 24, 1967. This application June 30, 1969, Ser. No. 842,787
Int. Cl. E04h *1/12*; F16m *13/02*
U.S. Cl. 52—143 **7 Claims**

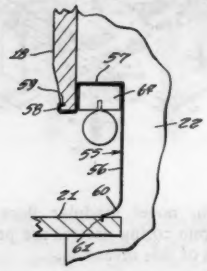


A portable building is suspended between a pair of upstanding utility poles anchored in the ground, the building being supported by a skid support assembly, in such a way as to provide for uniform load distribution and to avoid localized stresses or strains at the points of attachment of the supporting structure for the building to the poles.

3,562,981
INVERTED BASE
Erich Willfurth, 31 W. Chestnut St., Farmingdale, N.Y. 11735
Filed Feb. 12, 1968, Ser. No. 710,426
Int. Cl. E04f *19/04*; E06b *1/00*
U.S. Cl. 52—173 **5 Claims**

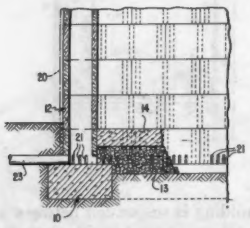
An inverted base such that when applied in position at the base of a wall and at floor level will be wholly disposed inwardly of the surface of the wall. The inverted base is formed of a thin, self-sustaining, yet sufficiently flexible metal and may be of any desired reentrant configuration, and is provided along its upper and lower side portions with lips each carrying a row

of projecting teeth. The lips are designed to respectively engage the wall and floor with the teeth to be driven thereinto. The wall is generally formed of panels of any suitable material secured to studs. In the application of the inverted base the lower horizontal edge portion of the wall panel is beveled with the terminal edge spaced a distance above the floor surface thus providing a reentrant space to receive the inverted base. If desired,



should a greater reentrant depth be desired a portion of the wall studs or beams may be cut out to accommodate the inverted base at a greater reentrant depth. The reentrant formation of the inverted base permits a variety of uses thereof as in doors and window frames, adjacent stair treads so to house an electric light, as a base opening housing fluorescent lights, and as a base opening receiving casings of baseboard heaters.

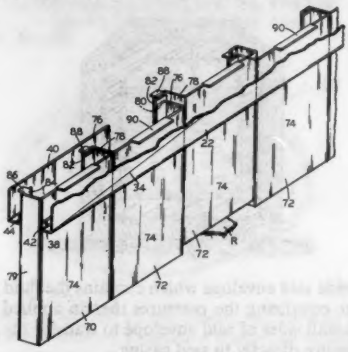
3,562,982
WALL AND FOUNDATION DRAIN SYSTEM
Allen C. Parezo, 16112 Laurel Ridge Drive, Laurel, Md. 20810
Filed May 9, 1969, Ser. No. 823,286
Int. Cl. E02d *27/00;* **E04b** *1/64, 1/70*
U.S. Cl. 52—169 **3 Claims**



Water accumulating in the supporting bed of gravel beneath a cellar floor is forced by hydrostatic pressure laterally into the hollow interiors of cement or cinder blocks that are mounted on foundation footings to constitute the base course of conventional hollow cinder block cellar walls. The water passes through slots in the inner side walls of the blocks and the interiors of the blocks are in open communication through similar slots in the end walls of the blocks.

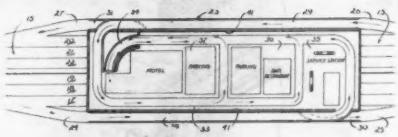
3,562,983
TRAILER SKIRTING
Eugene L. Rector, Syracuse, N.Y., assignor of one-half to Gerald H. Wolkon, Liverpool, N.Y.
Filed July 7, 1969, Ser. No. 839,557
Int. Cl. B62d *39/00, 63/08;* **E04b** *1/34*
U.S. Cl. 52—169 **5 Claims**

Skirt assembly for house trailers comprising an upper elongate panel adapted to be secured beneath the trailer and reach part way to the ground, and a plurality of vertical staves slidably connected to one another, and



slidably disposed in a slot in a flange along the panel bottom edge.

3,562,984
AIR RIGHTS BUILDING STRUCTURE
William E. Merle, Rte. 3, Box 3515, Auburn, Calif. 95603, and Arthur W. Miller, 1024 Cornell Ave., Albany, Calif. 94706
Filed Feb. 4, 1969, Ser. No. 796,512
Int. Cl. E04h *14/00*
U.S. Cl. 52—175 **9 Claims**

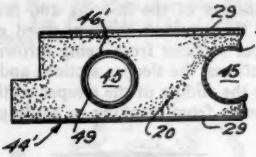


A building structure adapted to occupy air space above a freeway, toll road or other limited access roadway. The building structure spans the associated roadway but is relatively narrow so as to occupy very little land bordering the same, and it extends longitudinally therealong to any length necessary to accommodate the various services and faciilties to be offered the motorist. Entrance ramps to the building structure extend longitudinally therealong in cantilevered projection therefrom, and as a result of the considerable length of the building structure and corresponding length of the entrance ramps which may run the entire length of the structure, the ramps can accommodate deceleration of vehicles leaving the roadway, thereby reducing the length of the access roads connecting the roadway with the ramps and which otherwise would be required for vehicle deceleration.

3,562,985
REINFORCED SYNTHETIC RESIN STRUCTURAL PANELS
Joseph A. Nicosia, 819 N. Thatcher Ave., River Forest, Ill. 60305
Continuation of application Ser. No. 503,736, Oct. 23, 1965. This application Jan. 13, 1969, Ser. No. 793,225
Int. Cl. E04c *2/46*
U.S. Cl. 52—241 **4 Claims**

A building structure comprising a plurality of interconnecting barriers, said barriers comprising a plurality

of interconnecting panels, said panels comprising a rigid molded synthetic resin foam having embedded therein a

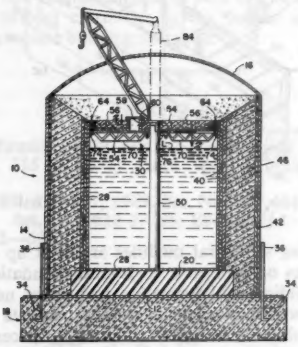


plurality of longitudinally extending tubular shaped passages formed by a plurality of tubular mesh screens.

3,562,986
LIQUID STORAGE CONTAINER

Ardell H. Nelson, Coraopolis, Leonard J. Hutter, William E. Latshaw, and John H. Adams, Pittsburgh, John Terlesky, New Brighton, and Dale R. Hauser, Coraopolis, Pa., assignors to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Oct. 4, 1968, Ser. No. 765,268
Int. Cl. E04b *1/32*; E04g *11/04*
U.S. Cl. 52—246 **16 Claims**



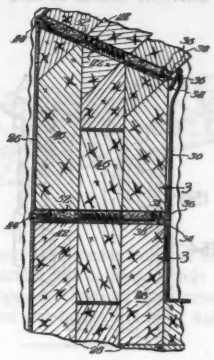
A liquid storage container includes inner and outer vessels spaced from one another to define an insulating space therebetween. In one form of the invention, the side walls of the inner and outer vessels each have resilient blanket means disposed adjacent thereto and defining a space therebetween. The space between the resilient blanket means is filled with a mass of substantially free-flowing lightweight thermal insulating material. The roof of the inner vessel is supported by support means disposed within the inner vessel and extending vertically upwardly therewithin. A roof of the outer vessel in another form of the invention is supported by support means supported by the roof of the inner vessel. Further modifications of the invention include a vessel having only one side wall with insulating means disposed in surrounding relationship to the side wall and held in place adjacent the outer surface thereof.

3,562,987
SECURING STRUCTURE FOR INSULATING PANELS

Bertram E. Eakin, Naperville, Ill., assignor to Institute of Gas Technology, a non-profit corporation of Illinois

Filed Sept. 20, 1968, Ser. No. 761,180
Int. Cl. E04b *1/38*; E04c *1/40*
U.S. Cl. 52—269 **5 Claims**

Structure for securing a plurality of insulating panels to a surface, such as a wall. A plurality of insulating panels are mounted against the structure. On the side of the insulating panels that is opposite to the side against which the panels are mounted, a rigid elongated member is provided. Springs are provided for interconnecting

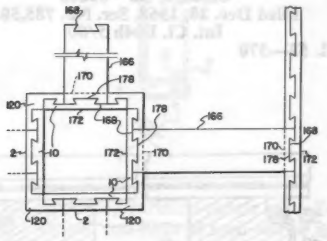


the rigid member to the wall-like structure, whereby the springs firmly, but resiliently, pull the rigid members against the insulating panels for securing them in place against the wall-like structure.

3,562,988
BUILDING BLOCKS, BRICKS, TILE, PANELS AND THE LIKE

Resta S. Gregoire, Newport, Pa., assignor to Z-Lock Block Co., Newport, Pa., a corporation of Delaware

Application Dec. 6, 1968, Ser. No. 784,282, which is a continuation of application Ser. No. 653,170, July 13, 1967. Divided and this application June 24, 1969, Ser. No. 850,290
Int. Cl. E04b *2/72*; E04c *1/10, 2/46*
U.S. Cl. 52—279 **1 Claim**



Beams have block interlock faces on their ends for interlocking support in a corresponding wall, and have a counter groove in their upper surfaces for receiving a horizontal ledge portion of ledge blocks which are at a corresponding level in the opposite layer of said wall.

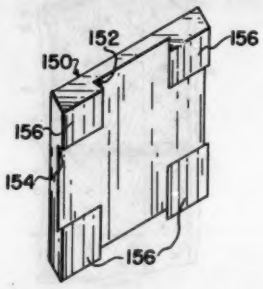
3,562,989
BUILDING BLOCKS, BRICKS, TILE, PANELS AND THE LIKE

Resta S. Gregoire, Newport, Pa., assignor to Z-Lock Block Co., Newport, Pa., a corporation of Delaware

Application Dec. 6, 1968, Ser. No. 784,282, which is a continuation of application Ser. No. 653,170, July 13, 1967. Divided and this application June 24, 1969, Ser. No. 850,291
Int. Cl. E04b *2/72*; E04c *1/10, 2/46*
U.S. Cl. 52—279 **1 Claim**

The blocks are square in face area, and have centrally extending dovetail grooves in both rectangular direc-

tions across their interlocking faces, leaving half ridge portions only at the corners of these faces of the blocks in one layer of a wall for interlocking with the single grooves of the blocks in the other layer, which are arranged so that alternate blocks in said other layer have

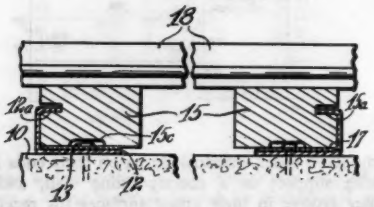


their grooves in alternate horizontally and vertically slidable engagement with said corner ridge portions of said cross-grooved blocks, providing a complete interlock against sliding between layers in either rectangular direction.

ERRATUM

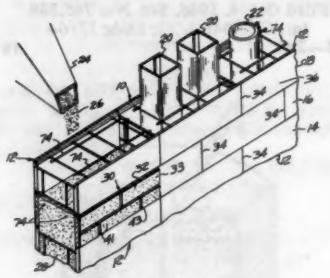
For Class 29—488 see:
Patent No. 3,563,713

3,562,990
MASSIVE SLEEPER CONSTRUCTION FOR FLOORING
William A. Boettcher, 4757 N. Clark St., Chicago, Ill. 60640
Filed Dec. 20, 1968, Ser. No. 785,503
Int. Cl. E04b *5/00*
U.S. Cl. 52—370 **3 Claims**



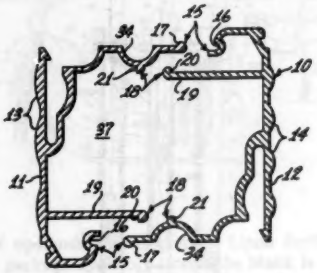
A sleeper construction for flooring. Pairs of metallic retainers are secured in parallelism to a supporting surface below the flooring. The retainers are lone and positioned in the manner of sleepers; and sleeper sections are laid on each retainer in longitudinal succession. Each pair of retainers is bent up on the outer side to form facing channels defining inward hooks. The sleeper sections are grooved in the outer sides to receive the hooks from the retainers, becoming interlocked against separation from the same, but freely slidable along the retainers; and the base portions of the latter receive a layer of mastic before the sleeper sections are mounted on the retainers. The sleeper series terminates endwise spacedly from a wall toward which the flooring is laid; and flooring also terminates in this manner. Thus, when the flooring, nailed to the sleeper sections, expands from moisture the sleeper sections slide along the retainers to relieve the pressure of the flooring and prevent it from buckling; and the retainers serve as fixed guides to prevent the sleeper sections from being thrown out of line. The mastic between the sleeper sections and the retainers serves to ease the sliding of the sleeper sections, and prevents the flooring from creaking or rattling.

3,562,991
BUILDING WALL CONSTRUCTION AND MODULE THEREFOR
Paul W. Kustusch, 9141 E. Jefferson Ave., Detroit, Mich. 48214
Filed July 29, 1968, Ser. No. 748,382
Int. Cl. E04b *2/32;* **E04f** *13/18*
U.S. Cl. 52—564 **5 Claims**



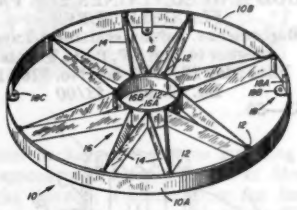
Interfitting structural modules are built up in overlapping courses or tiers on a horizontal foundation into the desired building wall formation and either used as such or as a form assembly into which concrete is poured. Each module includes a pair of laterally-spaced elongated parallel vertical panels interconnected at their tops and ends by wire grating spacers into the interstices of which are optionally inserted vertical tubular members of either round or square cross-section. These serve as conduits for heating, ventilation, plumbing or electric wiring when concrete is poured around them, or as columns when filled with concrete. The panels and wire grating spacers are capable of being transported and packed in knocked down form and assembled either at the building contractor's establishment or at the building site. Each module has longitudinal edge rabbets which interlock with one another at the joints between successive courses or tiers. The outer panels are optionally provided with spaced holes which receive pegs or pins, the heads of which are embedded in rectangular face-brick-simulating plates. The open ends of the end modules in the wall construction are closed by end closure panels inserted in grooves in the elongated parallel side panels. A simplified module (FIGS. 12 and 13) omits the longitudinal rods of the top spacers and also the vertical rods of the end spacers and uses simple tie rods with perpendicularly-bent ends entering holes in the top and ends of the panels. A still further simplified module (FIG. 14) omits the end tie rods or spacers of FIGS. 12 and 13, retaining only the top spacers, and resulting in a module which can be folded flat for storage or shipment, with the end rods added at the building site, or used without the end rods in the oblique arrangement of FIG. 14 which enables the wall thickness to be varied as desired.

3,562,992
BUILDING STRUCTURAL ELEMENT
Lewis R. Kinsey, 108 S. 25th St., Phoenix, Ariz. 85034
Filed Nov. 29, 1968, Ser. No. 780,114
Int. Cl. E04c 1/16, 1/10
U.S. Cl. 52—588 1 Claim



A building structural element formed of metallic or plastic extrusions which may be snapped together to form individual box elements which in turn can be snapped together as pre-cut extrusions in the proper sequence to form the complete building structure.

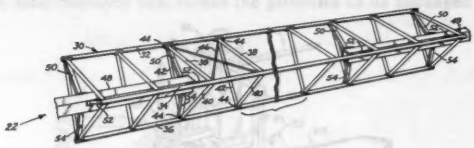
3,562,993
YARD FORM
John T. Humble, 2627 2nd E. 74104, and August C. Metcalf, 515 N. Gary Place 74110, both of Tulsa, Okla.
Filed Feb. 7, 1969, Ser. No. 797,404
Int. Cl. E02d 27/36; E04f 15/14
U.S. Cl. 52—626 2 Claims



This invention provides an apparatus for forming a decorative design characterized by being dismountable into a compact form and, when assembled, providing a star-shaped design for receiving material such as colored stone.

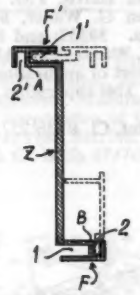
3,562,994
TRUSS
Carl V. von Linsowe, Portland, Oreg. (2820 Julio Ave., San Jose, Calif. 95124)
Filed Sept. 30, 1968, Ser. No. 763,661
Int. Cl. E04h 12/00
U.S. Cl. 52—655 19 Claims

An elongated truss including a frame formed from three elongated and spaced, parallel, triangularly disposed rails, struts distributed along and interposed between each combination of two rails, and tensors extending diagonally across the various spaces bounded by a pair of rails and a pair of struts. Mounts secured to and distributed along the rails support the struts and accommodate attachment of the tensors. Each mount is constructed to direct forces transmitted to it through a common point



adjacent the mount and located on the longitudinal axis of the rail supporting the mount. Loads are transmitted into and out of opposite ends of the frame through members positioned on the frame's neutral axis.

3,562,995
COMPONENTS OF STRUCTURES FOR THE ASSEMBLY OF PANELS
Charles Emile Zwickert, 108 Bis, Rue Jean Jaures, Noisy-le-Sec, France
Filed Nov. 19, 1968, Ser. No. 777,093
Claims priority, application France, Nov. 22, 1967, 129,255
Int. Cl. E04c 3/32, 3/30
U.S. Cl. 52—732 9 Claims

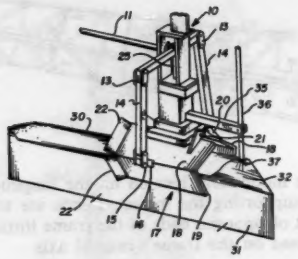


Member for supporting partition panels has a Z-shaped cross-section. F-shaped end piece at each end of member, cross bars of F being perpendicular to end portion of Z, thereby forming two grooves for accommodating auxiliary members. In alternative embodiment, member has rectangular cross-section formed with two outwardly-facing grooves at the ends of its sides, and two opposite ends have perpendicular extensions comprising back-to-back F-shaped elements.

3,562,996
VALVE SACK OPENER AND CARRIER MECHANISM
L. D. Adcox, Monte Vista, Colo., assignor of one-half to John B. Milne, Monte Vista, Colo.
Filed Jan. 23, 1969, Ser. No. 793,296
Int. Cl. B65b 43/36
U.S. Cl. 53—3 7 Claims

A valve sack opener and carrier mechanism for opening the valve of the sack by injection of a pressurized air stream, and carrying the sack, with the valve in open position, to the spout of a filling machine, comprises a carrier

having a pair of members pivotally connected to a movable support, the members being pivotally movable transversely into sack receiving and supporting position and into sack flap engaging position for maintaining the valve in open position during travel of the sack to the spout of



a filling machine. Switch means activated by a switch contacting pad on the carrier operates an air nozzle for injection of air into the valved flop of the sack during a predetermined part of the travel of the carrier.

3,562,997

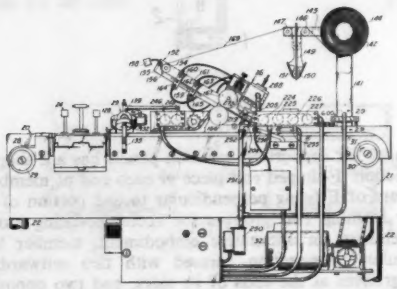
CARTON CLOSING AND LABELING METHOD

David L. Pearl, 2592 Briarcliff Road NE., Atlanta, Ga. 30329; George E. Harris, P.O. Box 6065, Marietta, Ga. 30060; John G. Waller, 806 Cambridge Ave., College Park, Ga. 30337; and Beverly P. Head, Jr., 9 Rockdale Lane, Birmingham, Ala. 35213

Continuation-in-part of application Ser. No. 626,288, Mar. 27, 1967. This application June 17, 1968, Ser. No. 737,601

Int. Cl. B23b *25/14*

U.S. Cl. 53—14 **4 Claims**



Method of closing and labeling egg cartons wherein each egg carton includes a tray, a locking flap hinged to one side of the tray, and a lid hinged to the other side of the tray comprising the steps of moving the carton along a prescribed path, folding the lid over the locking flap to close the carton, heating the container and moving a continuous strip of labeling material toward the heated surface to press one end of one of the labels onto the carton, partly severing the label from the strip and stopping the feeding of the strip so that the movement of the carton finishes severing the label, and pressing the severed label onto the carton.

3,562,998

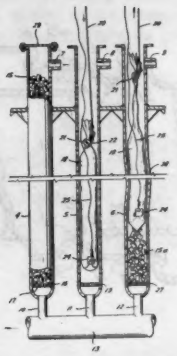
METHOD FOR FILLING VERTICAL PROCESS VESSELS WITH PARTICULATE MATERIALS

Tommy Ray Edwards, Alvin, Tex., assignor to Catalyst Services, Inc., Alvin, Tex., a corporation of Texas

Filed Sept. 17, 1968, Ser. No. 760,206

Int. Cl. B65b *1/04*

U.S. Cl. 53—29 **8 Claims**



A quick and relatively inexpensive method for filling vertical process vessels, for instance, reactors or packed towers, with particulate material such as catalyst or other packing, while preventing contamination and damaging thereof. A special flexible bag with a bottom seal which may be opened by means of a release line is filled with the material and then gently lowered into the vessel by means of an elevator attached to the upper portion of the bag. The bottom seal is then opened by pulling upon the release line, permitting the contained material to drop gently into the vessel. The bag is retrieved by pulling up on the elevator line, and the process is repeated until the vessel is filled to the desired level.

3,562,999

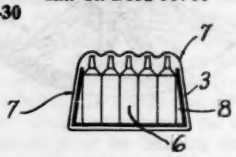
METHOD AND CONTAINER FOR PACKING FLEXIBLE TUBES

Roger Barbedienne, Saint-Germain-en-Laye, France, assignor to Seal GP, Paris, France

Filed May 28, 1969, Ser. No. 828,511

Int. Cl. B65b *53/00*

U.S. Cl. 53—30 **8 Claims**



This invention relates to a method for packing flexible tubes and a container therefor, in which the container generally comprises a polygonal base and a plurality of side pieces sharing a common edge with the base. Flexible tubes are placed in the container, and the side pieces are urged toward the necks of the tubes to hold the tubes in place by a contractible sheet or envelope.

3,563,000

PACKAGING APPARATUS

John B. Whitehouse and Gunnar G. B. Alhorn, Sunnyvale, Calif., assignors to Fibreboard Corporation, San Francisco, Calif., a corporation of Delaware

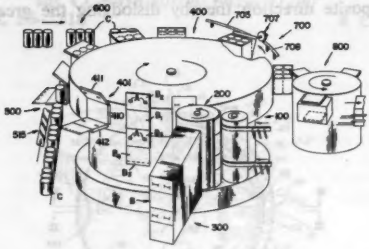
Filed Nov. 28, 1967, Ser. No. 686,020

Int. Cl. B65b *5/10*

U.S. Cl. 53—48 **19 Claims**

A packaging apparatus comprises a feeder arranged to insert plastic clips into a flattened paperboard blank

arranged on a carton assembly turret. The turret rotates to transfer the blank to an articulated cage mounted on a rotatably mounted package assembly turret. The cage closes to form a pocket in the blank which receives a



plurality of upstanding cans therein. Upon further rotation of the package assembly turret, the blank is wrapped and secured around the cans. The package is then transferred to a compression and discharge turret.

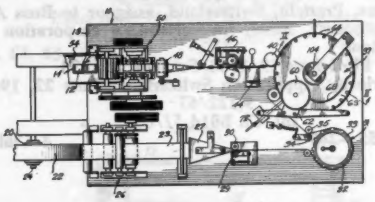
3,563,001
FILLING HEAD FOR STRIP STOCK PACKAGING MACHINE

Charles E. Cloud, Wilmette, and Richard F. Purvinis, Chicago, Ill., assignors to Cloud Machine Corporation, Skokie, Ill., a corporation of Delaware

Continuation-in-part of application Ser. No. 484,481, Sept. 1, 1965. This application Feb. 14, 1968, Ser. No. 705,379

Int. Cl. B65b *1/02*

U.S. Cl. 53—183 **12 Claims**



A continuous packaging apparatus including a sealer for forming spaced seals along a length of film relative to print marks thereon; a motor drive for feeding the film to the sealer; a filling wheel including a filling plate mounted on bearings on an inclined axis relative to the vertical axis of a lower supporting wheel of the filling wheel; and filling spouts on the filling wheel such that when the top plate and the lower filling wheel are rotated, the filling spouts are projected into the spaces between the lands on the lower wheel and into the pockets positioned on the vertical inclined lands on the lower wheel to enable the pockets to be readily filled.

3,563,002
GROCERY PACKAGING APPARATUS

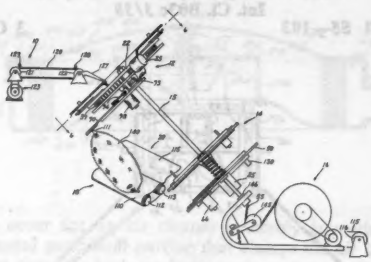
Frank M. Givin, 1487 Collin Road, Colorado Springs, Colo. 80907

Filed Mar. 5, 1969, Ser. No. 804,420

Int. Cl. B65b *43/00*

U.S. Cl. 53—183 **10 Claims**

A packaging apparatus for randomly packing grocery items consisting of a plurality of various sizes of cans, boxes and the like into a nylon net or mesh bag, includes a supply roll of tubular net material fed through an annular feed orifice, and a traveling head with a large central aperture has a plurality of net holding fingers which move to the center at the orifice for picking up the netting and outwardly to the edge of the orifice in a position remote from the feed for opening the mouth of the netting. The traveling head moves upwardly away from the feed orifice pulling out a predetermined amount of the netting. A load conveyor belt moves the groceries to be packaged



into the mouth of the bag filling the same while the netting is oscillated. The filled bag is then sealed at the bottom by heat sealing and cutting it from the supply, and the bag is twisted to close the mouth and the twisted neck is heat sealed providing a sealed bag for the customer. The sealed bag is then released from the filling unit, passed to a conveyor belt for delivery to the customer.

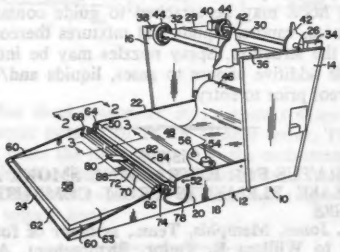
3,563,003
WRAPPING MACHINE

Frank Pizmoht, Willoughby, Ohio, assignor to Cleveland Heat Sealing Equipment Manufacturing Company, Cleveland, Ohio, a corporation of Ohio

Filed Nov. 6, 1968, Ser. No. 773,796

Int. Cl. B65b *67/10*

U.S. Cl. 53—390 **15 Claims**



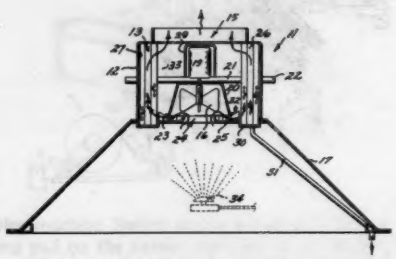
A package wrapping machine having rolls of wrapping material supported on a rotatable shaft held at either end by a framework. A platform for wrapping packages is mounted behind a closely spaced heated sealing plate on the framework. An electrically heated wire is suspended by two rotatably mounted brackets and positioned between the wrapping platform and the sealing plate. In its recessed position, the heated wire is at a lower level than the platform in order to prevent inadvertent contact with the wire. During use, the heated wire is raised to a higher level by an actuator which rotates the brackets holding it. The actuator may be a plate which is motivated by contact with the package as it is moved from the wrapping platform to the heating plate. A manually operated foot

pedal may also function as the actuator. A shield is optional to further protect the heated wire in its recessed position.

3,563,004
SEPARATOR STRUCTURE

Arthur C. Schouw, Corunna, Mich., assignor to Anpol Research Corporation, Owosso, Mich., a corporation of Michigan

Filed Oct. 29, 1968, Ser. No. 771,490
Int. Cl. B03c 3/38
U.S. Cl. 55—103 3 Claims



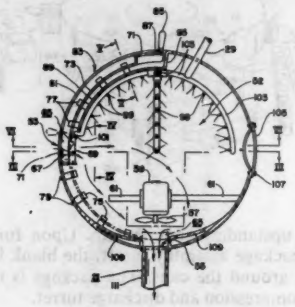
The device of the present invention is a compact separator structure for removing contaminants from contaminant laden gases or vapors and combines an orifice entry, a fan chamber and a cylindrical foraminous filtration column or zone surrounding the fan chamber and through which gases and/or liquids or mixtures thereof are spirally entrained to exhaust in a velocity reduction chamber defined by the fan chamber and the outer case and through an exhaust port. The entry and exhaust openings are in axial alignment and the axis of the fan or blower is coaxial therewith and the foraminous cylindrical filtration chamber is concentrically disposed in respect to the axis of the structure and the entire device is encased as between the entry and exhaust openings with a gravity sump provided at the base of the filtration column. Flow directors assist the spiralling flow of gases, vapors, liquids and/or mixtures thereof and a gathering hood may be attached to guide contaminants and/or gases, vapors, liquids and mixtures thereof to the entry of the structure. Spray nozzles may be interposed to provide additive vapors to gases, liquids and/or mixtures thereof prior to entry.

3,563,005
APPARATUS FOR EXTRACTING SMOKE AND GREASE ELEMENTS FROM COMBUSTION GASES

James N. Jones, Memphis, Tenn., assignor of forty percent to William R. Tudor, Birmingham, Ala.

Filed Oct. 22, 1968, Ser. No. 769,524
Int. Cl. B01d 47/06
U.S. Cl. 55—228 8 Claims

Smoke and grease particle extracting apparatus particularly useful in commercial kitchen installations and in the ventilator or exhaust system in such kitchen installation. The apparatus includes means for collecting and rendering the grease particles in thickened solid form for readily disposing of the thickened grease in waste or for further processing. The structure includes a cleaner unit having a hollow housing having an inlet and an outlet opening permitting passage of grease-particle-laden combustion gases and elements to pass into and out of the hollow interior of the cleaner unit. The apparatus includes selectively shiftable filter means arranged in the interior of the cleaner unit and such filter means which may be selectively arranged across the inlet or across the outlet opening of the cleaner housing. When the filter is arranged over the inlet of the cleaner unit housing, grease and foreign particles are filtered out of the combustion gases and constrained in the filter. When the filter is arranged over the outlet opening of the cleaner unit housing, hot water or hot detergent liquid passes through the filter in a reverse or opposite direction thereby dislodging the grease and

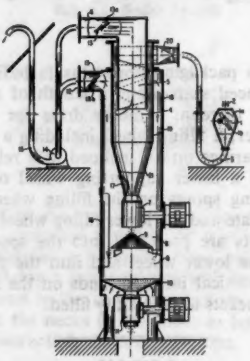


foreign material constrained in the filter. Water issuing from the nozzles in the interior of the cleaning unit provide flushing means for heating and flushing the grease substances from the filter mass. Provided also in the apparatus is a grease intercepting or collecting tank for collecting the hot water and grease for subsequent reuse or disposal.

3,563,006
SEPARATING AND COOLING DEVICE FOR PLASTIC GRANULES

Fritz Sutter, Pratteln, Switzerland, assignor to Buss Aktiengesellschaft, Basel, Switzerland, a corporation of Switzerland

Filed June 19, 1968, Ser. No. 738,233
Claims priority, application Switzerland, June 22, 1967, 9,122/67
Int. Cl. B01d 51/00
U.S. Cl. 55—267 4 Claims

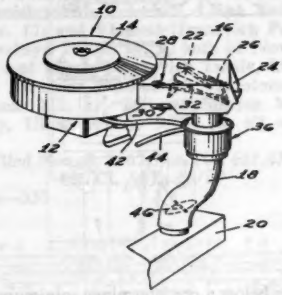


A separating and cooling device for producing cooled plastic granules comprising a cylindrical casing with distributing members and air cooling access means arranged in its lower end, a second smaller cylindrical casing within said first casing and coaxially arranged therewith, and a third still smaller cylindrical casing within said second casing, the third casing being provided with an outlet collar.

3,563,007
FUEL VAPOR CONTROL

James R. Clarke, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Filed Oct. 7, 1968, Ser. No. 765,505
Int. Cl. B01d *50/00*; F02m *31/00*
U.S. Cl. 55—316 4 Claims

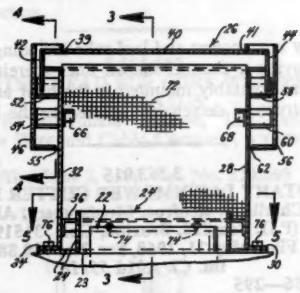


During an internal combustion engine hot soak cycle, fuel tank and carburetor bowl fuel vapors are absorbed by carbon in a canister located in a hot air duct portion of the engine air cleaner; normal engine operation purges the vapors from the canister into the air cleaner except during high load engine operation, when the hot air duct is closed to avoid unnecessary restrictions to air flow.

3,563,008
SPARK ARRESTOR

Edward F. Heaton, Jr., 5226 Pinedale Court, St. Louis, Mo. 63129

Filed Aug. 11, 1969, Ser. No. 848,846
Int. Cl. B01d *50/00*
U.S. Cl. 55—327 11 Claims

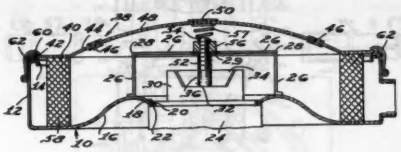


An inverted V-shaped enclosure with perforate walls is mounted above the exhaust stack of a diesel-powered unit of a railroad locomotive, it has an open-bottom, closed-top conduit at the apex thereof, and it has internally-baffled retention bins at the opposite ends of that conduit. Any carbonaceous particles, which are grain size or larger and which may break away from the exhaust stack under full throttle condition, will be guided upwardly into the conduit by the perforate walls of the inverted V-shaped enclosure, and will then be forced into the retention bins by exhaust gases and vapors which move through, and toward the opposite ends of, the conduit. In those retention bins, those carbonaceous particles will be swirled around by the interaction of the baffles and the exhaust gases and vapors, and will repeatedly strike each other and those baffles until they are ground into powder.

3,563,009
FLOATING TOP AIR CLEANER ASSEMBLY

Donald G. Wheatley, Livonia, and George H. Muller, Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Filed Oct. 25, 1968, Ser. No. 770,474
Int. Cl. B01d *27/08*
U.S. Cl. 55—510 6 Claims

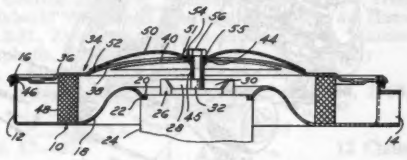


The cover for an air cleaner assembly is made of a sheet metal peripheral portion that clamps the air cleaner element onto the body and a convex center portion that ducts air from the filter element to the carburetor inlet. An annular resilient member connects the center portion to the peripheral portion and permits limited resilient or floating movement of the center portion relative to the body.

3,563,010
SOFT TOP AIR CLEANER ASSEMBLY

Donald G. Wheatley, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Filed Oct. 25, 1968, Ser. No. 770,476
Int. Cl. B01d *27/08*
U.S. Cl. 55—510 5 Claims



A rubber sheet preformed into a convex shape is used as the center portion of an air cleaner cover. The sheet ducts air from the filter element to the carburetor intake and retains its shape under engine vacuum transmitted through the carburetor but deflects upon any contact with the vehicle hood.

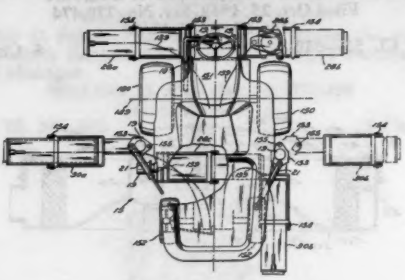
3,563,011
MOWER MACHINE

Robert K. Bramley, Cleveland, and Hugh A. Bourassa, University Heights, Ohio, assignors to Kearney-National Inc., New York, N.Y., a corporation of Delaware

Continuation-in-part of application Ser. No. 705,395, Feb. 14, 1968. This application Apr. 21, 1969, Ser. No. 818,002
Int. Cl. A01d *75/30*
U.S. Cl. 56—7 13 Claims

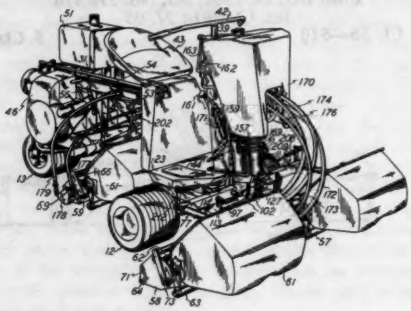
A hydraulic control system for a multiple unit mowing machine is disclosed. Each mower unit is independently retractable and individually driven through a flexible cable drive. Hydraulic mower clutches are separately connected to an actuator control circuit to be automatically disengaged when their associated mowers are retracted. The mower clutches are also operable to slip to allow

the associated flexible cable to stop with the mower when a mower unit becomes obstructed. An integral implement circuit of the mowing machine transmission is utilized to drive hydraulic actuators which individually



positions several mowing units. Novel and improved valve and circuit means are provided to retract and hydraulically lock each mower actuator. Outboard mowing units are yieldably extended under the pressure of an accumulator connected to associated bidirectional actuators.

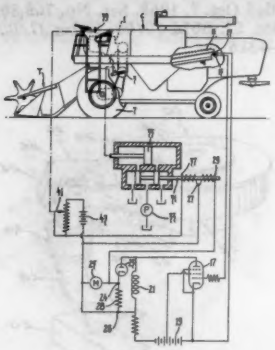
3,563,012
TRACTOR FOR LAWN MOWERS
Raymond K. Strasel, Winthrop Harbor, Ill., assignor to Jacobsen Manufacturing Company, Racine, Wis., a corporation of Wisconsin
Filed Oct. 18, 1968, Ser. No. 768,647
Int. Cl. A01d *75/30*; B60k *3/00*
U.S. Cl. 56—7 **9 Claims**



Tractor for lawn mowers of the reel type and pivotally mounted on the tractor. The tractor has three ground wheels, a prime mover, and drive means extending to the wheels and to the lawn mowers. A hydraulic system is shown as the drive means, and the tractor frame provides an operator's seat on the line through the center of gravity of the tractor. The engine is to the rear of the operator's seat, and the tractor frame is hollow for providing the hydraulic capacity and for conducting hydraulic fluid to the desired locations on the tractor.

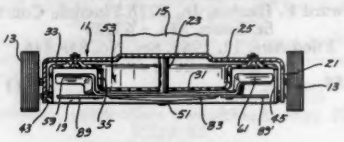
3,563,013
AUTOMATIC COMBINE CONTROL
Lee E. Elfes, Bloomfield Hills, Mich., assignor to Massey-Ferguson Inc., Des Moines, Iowa, a corporation of Maryland
Filed July 22, 1968, Ser. No. 746,485
Int. Cl. A01d *41/00*
U.S. Cl. 56—20 **4 Claims**

A harvesting combine with a crop separating unit and having an electromechanical transducer located in the machine at a point for measuring the relative amount of unseparated grain and thereby the efficiency of the separation unit, automatic ground speed control for the machine that is responsive to changes in the output of the transducer to change the speed of the machine to maintain



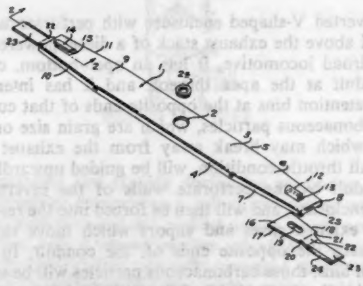
the grain loss below a predetermined minimum. A manual control is provided to set the predetermined minimum and override the automatic control.

3,563,014
COMBINATION LAWNMOWER AND LEAF RAKE
Ralph W. Krewson, West Des Moines, Iowa (629 Bompart, Webster Groves, Mo. 63119)
Filed Feb. 20, 1967, Ser. No. 617,408
Int. Cl. A01d *35/26*
U.S. Cl. 56—25.4 **3 Claims**



A rotary lawnmower and leaf rake including a wheeled housing having a channel-shaped liner therein, a cutting blade means rotatably mounted in the liner and a collection bag structure detachably secured to the housing.

3,563,015
ROTARY LAWNMOWER CUTTER BAR
Charlie C. Renfroe, Montgomery, Ala. (P.O. Box 250, Broxton, Ga. 31519)
Filed May 21, 1968, Ser. No. 730,888
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **2 Claims**



A cutter bar for power driven rotary blade-type mowers having detachable cutter blades which are slide-

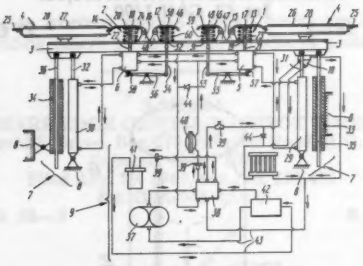
ably mounted in spaced apart channels on the ends of the cutter bar and includes stops extending laterally of the cutter bar and cutter blades to prevent the longitudinal movement of the cutter blades outwardly of the cutter bar.

3,563,016

SENSING UNIT FOR A GRAPE HARVESTER FOR ENABLING THE CUTTING APPARATUS TO FOLLOW THE SURFACE TO BE WORKED

Cheslav Stanislavovich Tolochko, Ulitsa Budennovskaya 203/2, kv. 17; and Vladimir Ivanovich Popov, Ulitsa Budennovskaya 203/2, kv. 9, both of Novocherkassk, U.S.S.R.; and Miron Vasilievich Tsitsiv, Ulitsa Nagornaya 14; Alexandr Nikolaevich Varfolomeev, Kotovskoe shosse 22b, kv. 16; and Marlen Mikhailovich Gervolsky, Ulitsa Frunze 9, kv. 3, all of Kishinev, U.S.S.R.

Filed Nov. 8, 1967, Ser. No. 681,435
Int. Cl. A01g *19/00*
U.S. Cl. 56—331 4 Claims



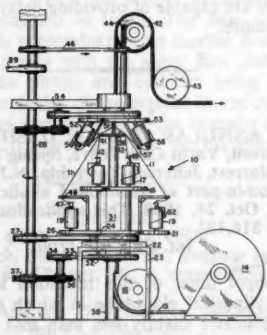
A sensing unit is provided for enabling the operating elements of grape harvesters to follow the surfaces to be worked and specifically enabling the cutting apparatus of the grape harvester to follow the surface of the trellis canopy; the unit comprises a grape harvester frame and an actuating mechanism mounted on the frame in turn supporting a movable control element which is operated by a hydraulic drive system by means of two valve-type hydraulic selectors.

3,563,017

SERVING HEAD FOR CORE WRAPPING APPARATUS

Lawrence B. Woolman, Marion, Ind., assignor to Anaconda Wire and Cable Company, a corporation of Delaware

Filed June 2, 1969, Ser. No. 829,609
Int. Cl. B65h *81/08*
U.S. Cl. 57—13 3 Claims



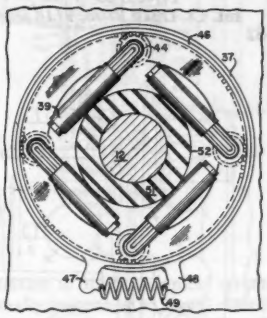
In an apparatus for winding strands in two directions around an advancing core, instead of passing through a die, the strands approaching the core are deflected over the outer surface of a ring or plate and pass over each other on this surface.

3,563,018

WINDING MACHINE GUIDE

Heinz Lutjen, Yonkers, N.Y., assignor to Anaconda Wire and Cable Company, a corporation of Delaware

Filed Mar. 20, 1969, Ser. No. 808,919
Int. Cl. B65h *81/08*
U.S. Cl. 57—15 9 Claims



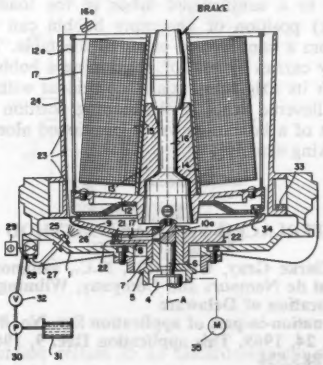
In a machine for winding tapes or other strands around an advancing core, a guide for the core is non-rotating and is mounted to the rotating frame of the machine by means of a low-friction bearing.

3,563,019

METHOD OF AND APPARATUS FOR SPINNING AND TREATING THREAD

Aloys Greive, Munster, Westphalia, and Aloys Treus, Havixbeck, Westphalia, Germany, assignors to Hamel G.m.b.H., Zwirnerei-und Spinnereimaschinen, Munster, Westphalia, Germany, a corporation of Germany

Filed Mar. 26, 1969, Ser. No. 810,464
Claims priority, application Germany, Mar. 28, 1968, P 17 60 063.4
Int. Cl. D01k *7/86, 13/30*
U.S. Cl. 57—35 12 Claims



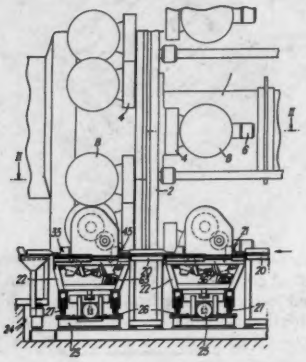
A thread is drawn axially off a relatively nonrotatable spool and guided through the center of the spool which is equipped with a light friction brake for the thread. On leaving the spool the thread is fed through a lateral hole in a rotating hollow shaft and onto a rotating disk mounted on the shaft. A jet of treating liquid is pulsed against this disk to soak the thread moving radially outward

thereon. Then the thread is drawn up between a sleeve surrounding the spool and the spool itself and wound on a bobbin or yarn package.

3,563,020
WIRE-STRANDING AND WIRE-ARMOURING MACHINES

Edwyn Harris, Tarvin, near Helsby, and Raymond J. Papworth, Hedge End, Botley, England, assignors to British Insulated Callenders' Cables Limited, London, England

Filed Apr. 8, 1969, Ser. No. 814,339
Claims priority, application Great Britain, Apr. 10, 1968, 17,269/68
Int. Cl. D01h *9/00, 9/18*
U.S. Cl. 57—52 **20 Claims**



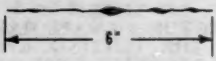
A bobbin-loading and unloading device for use with a cable-making machine of the kind in which bobbins are rotatably supported on cantilevered arbors carried on frames rotatable about the machine axis, comprises a loading table for supporting a bobbin with its axis substantially horizontal. The table is constrained to be reciprocated in a direction transverse to the machine axis from a normal position in which it is clear of a rotating frame of the machine to a forward position. At the forward position either a full bobbin can be transferred from the table to a cantilevered arbor in the loading (and unloading) position or an empty bobbin can be transferred from a cantilevered arbor to the table. The table preferably carries means for positioning a bobbin on the table with its axis substantially coincident with the axis of a cantilevered arbor in the loading position and may form part of a bobbin-conveyor positioned alongside the cable-making machine.

3,563,021
INTERLACED YARN AND METHOD OF MAKING SAME

Walter Clarke Gray, Greenville, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Continuation-in-part of application Ser. No. 801,596, Feb. 24, 1969. This application Dec. 9, 1969, Ser. No. 883,536
Int. Cl. D02g *3/22*
U.S. Cl. 57—140 **12 Claims**

Compact multifilament yarn is interlaced to weave satisfactorily as warp in automatic power looms without size or twist. Continuous filaments having an average strength of at least 4.0 grams per filament, and at least 50% having a tenacity of at least 2.0 grams per denier, are pased through jet streams to produce yarn having an exceptionally uniform bundle cohesion measured after a backwinding test of stability to working in use. The yarn has a highly uniform appearance free from filament

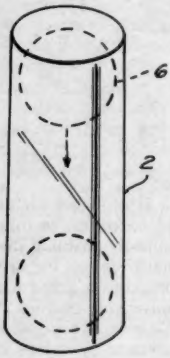


defects, e.g., no more than 10 defects per million end yards of yarn when tested with a conventional defect analyzer.

3,563,022
SHEAR FLOW DASHPOT TIMER

David S. Breed, Box 270, Hillcrest Road, R.D. 2, Boonton, N.J. 07005

Filed Aug. 18, 1969, Ser. No. 851,010
Int. Cl. G04f *1/00*
U.S. Cl. 58—1 **17 Claims**



The dashpot timer of this invention includes a substantially cylindrical glass tube in which travels a piston having a diameter slightly less than that of the interior of the tube. A liquid, gum, grease or compound covers the interior surface of the cylinder in which the piston is adapted to travel. The flow ingenerated in the cylinder is predominantly a shear flow with the pressure flow being relatively insignificant. The device of the present invention operates in the lubrication region whereby relatively small timers are capable of providing delays up to several seconds or more.

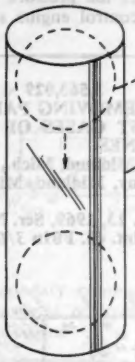
3,563,023
LIQUID ANNULAR ORIFICE DASHPOT TIMER

David S. Breed, Yacht Club Drive, Spring Brook Terrace, Lakeforrest, Jefferson Township, N.J. 07005

Continuation-in-part of abandoned application Ser. No. 770,205, Oct. 24, 1968. This application Dec. 9, 1968, Ser. No. 816,132
Int. Cl. G04f *1/00*
U.S. Cl. 58—2 **21 Claims**

The dashpot timer of this invention includes a substantially cylindrical glass tube in which travels a piston having a diameter slightly less than that of the interior of the tube. A liquid or gum defines the medium in the cylinder in which the piston is adapted to travel. The flow ingenerated in the cylinder is predominantly a pressure

flow with the shear flow being relatively insignificant. The device of the present invention operates in the lubrication region whereby relatively small timers are capable of providing delays up to several months or more.

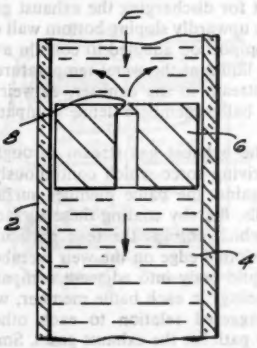


3,563,024

SHARP EDGE ORIFICE DASHPOT TIMER

David S. Breed, Box 270, Hillcrest Road, R.D. 2, Boonton, N.J. 07005

Filed Aug. 27, 1969, Ser. No. 853,473
Int. Cl. G04b *45/00*
U.S. Cl. 58—2 8 Claims



The dashpot timer of this invention includes a substantially cylindrical glass tube in which travels a piston having a diameter slightly less than that of the interior of the tube. A low viscosity liquid defines the medium in the cylinder in which the piston containing a sharp edge orifice is adapted to travel. The flow ingenerated in the cylinder is predominantly an inertial flow through the sharp edge orifice with the shear flow and pressure flow between the piston and cylinder being relatively insignificant. The device of the present invention operates in the inertial flow region whereby the viscosity effects are relatively small compared with the inertial effects of the fluid.

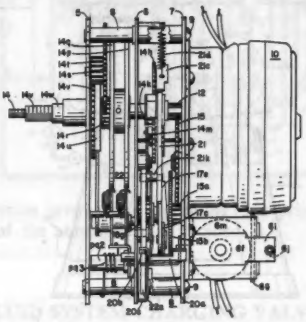
3,563,025

CLOCK MECHANISM

Robert A. Kulick, Streamwood, Ill., assignor to DuKane Corporation, St. Charles, Ill., a corporation of Delaware

Filed Aug. 14, 1969, Ser. No. 849,995
Int. Cl. G04c *9/00*
U.S. Cl. 58—35 3 Claims

The invention relates to a clock driven by a synchronous electric motor and adapted to be reset at periodic intervals from signals received from a master clock. The clock forming the subject matter of this invention is provided with means for inhibiting or preventing a reset signal from causing reset action to occur if the clock is on time. If reset is called for, then such action takes place over an appropriate time interval. The particular invention involved here relates to the mechanical structure between armature normally responsive to signal reset impulses and a generally conventional reset mechanism. This conventional reset mechanism has been modified to embody the reset inhibiting function. In addition, the cam arrangement provides for more accurate control.

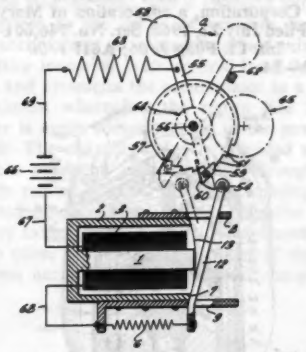


3,563,026

ELECTROMAGNETIC ACTUATING APPARATUS FOR CLOCKWORK MECHANISMS

Alfred Kreidler, Zurich, Switzerland, assignor to Metall-Invent S.A., Zug, Switzerland

Original application June 15, 1967, Ser. No. 646,287, now Patent No. 3,477,049. Divided and this application Sept. 19, 1969, Ser. No. 859,262
Int. Cl. G04c *1/00*
U.S. Cl. 58—41 4 Claims



The invention relates to an electromagnetic actuating apparatus in which an armature is attracted by an electromagnet when current is switched on. This kind of apparatus is employed for actuating electric switches, such as clockwork winders or the like. The armature rolls upon the pole piece in a manner so as to reduce noise of operation and the armature completes an operative electrical circuit from a battery to the electromagnet through at least a portion of the apparatus.

3,563,027

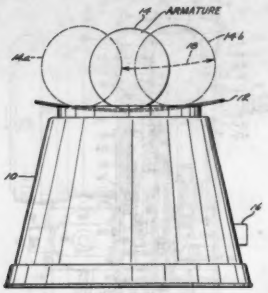
ENERGY TRANSFORMATION DEVICE

Harold B. Greenberger, Cleveland Heights, Ohio, assignor of one-half to Richard R. Walling, Hudson, Ohio

Continuation of application Ser. No. 510,825, Dec. 1, 1965. This application Jan. 15, 1969, Ser. No. 792,230

Int. Cl. F03g 7/06

U.S. Cl. 60—23 1 Claim



An energy transformation device for transferring heat energy into kinetic energy. A suitable heat source is provided such as an electric heater, a gas flame, etc., and, in the preferred form of the invention, a heated solder pot is used. Disposed on the top surface of the solder pot is an elongated cylindrical object balanced to roll back and forth on such surface. When the heat is turned on, the cylindrical object will roll back and forth or oscillate on such surface indefinitely. The object may be any suitable elongated cylindrical object such as a solid cylindrical bar, a hollow cylindrical object such as a tin can, and, in the preferred form, a small motor or generator armature is employed.

3,563,028

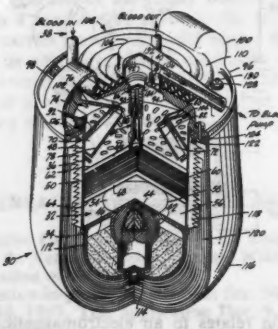
IMPLANTABLE RADIOISOTOPE-FUELED STIRLING ENGINE

Richard B. Goranson and Richard P. Johnston, Kennewick, William R. Martini, Richland, William H. McDill, Kennewick, Jack E. Noble, Prosser, and Maurice A. White, Kennewick, Wash., assignors to McDonnell Douglas Corporation, a corporation of Maryland

Filed July 22, 1968, Ser. No. 746,601

Int. Cl. F03g 7/06; A61f 1/00

U.S. Cl. 60—24 10 Claims



Long-life, radioisotope-fueled, thermal regenerative engine for driving a blood pump is used in a circulatory support unit which is implantable in an animal. Engine includes an encapsulated radioisotopic heat source with a thermal reservoir, a thermodynamic converter, a heat exchanger using blood as the cooling medium, and a control device to regulate engine power output. The converter includes a cylinder containing a regenerator and drive plug assembly suspended from a counterbalanced linkage. The control device includes an adjustable bypass valve which regulates the pressure difference appearing across the plug to control engine speed and, therefore, its power output.

3,563,029

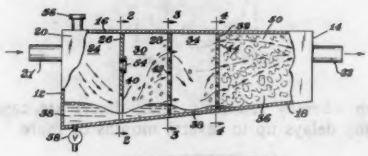
MUFFLER FOR REMOVING PARTICULATE LEAD FROM EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Frederick J. Lowes, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed Mar. 13, 1969, Ser. No. 806,809

Int. Cl. F01n 3/04

U.S. Cl. 60—30 8 Claims



Muffler for an internal combustion engine which is adapted for removing particulate lead matter from the exhaust gases of the engine to prevent discharge of the noxious matter into the surrounding atmosphere. Basically, the muffler comprises a canister of the usual type employed with internal combustion engines, which has an inlet port for receiving exhaust gases from the engine and an outlet port for discharging the exhaust gases to the atmosphere. An upwardly sloping bottom wall of the canister defines a sump portion adapted to contain a flux composition which is liquid at the usual temperature range of the exhaust gas stream in the canister. A weir member and one or more baffle members define compartments within the canister.

Flow of the exhaust gas stream through the canister provides a driving force which continuously splashes the liquid flux against the baffle member surfaces and compartment walls, thereby coating these surfaces with a flux film media which entraps the lead particulate matter in the gases. A slotted edge on the weir member meters flow of the gas-liquid body into adjacent compartments of the canister. Openings in each baffle member, which are positioned in staggered relation to each other, provide a tortuous flow path for the exhaust gases. Smaller openings in the baffle members, together with an upwardly sloping bottom wall on the canister permit continuous flowback of the liquid flux toward the forward portion of the canister. Additional features of the muffler include (1) a gas flow port in the weir member, which is opened or closed by pressure of the exhaust gases, to provide for gas flow through the canister in the event of solidification of the flux composition; and (2) filling the rearmost chamber of the canister with a porous material capable of trapping and separating the liquid flux from the exhaust gases.

3,563,030

EXHAUST SYSTEM

Ervin C. Lentz, Karl K. Kerns, Jackson, and Robert N. Balluff, Leslie, Mich., assignors, by mesne assignments, to Tenneco Inc., Houston, Tex., a corporation of Delaware

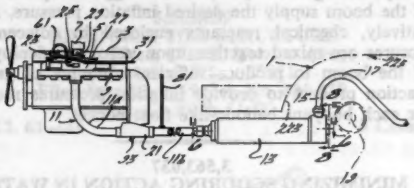
Application Sept. 1, 1964, Ser. No. 393,623, which is a continuation-in-part of applications Ser. No. 290,403, and Ser. No. 290,499, both June 25, 1963. Divided and this application Feb. 10, 1969, Ser. No. 816,448

Int. Cl. F01n 7/16, 1/14, 3/08

U.S. Cl. 60—30 5 Claims

A catalytic reactor system for reducing the level of unburned emissions from an automobile internal combus-

tion engine includes, in combination, a reactor device of special construction and an automatically controlled device for admitting secondary combustion air and also means for limiting the level of hydrocarbons and CO upon deceleration of the engine.

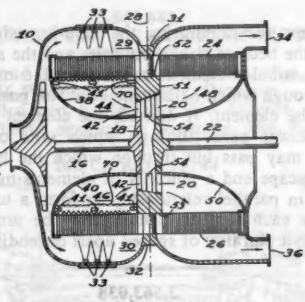


3,563,031

GAS TURBINE ENGINE HEAT EXCHANGER AND COMBUSTION SYSTEM

Armenag Topouzian, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

Filed Jan. 13, 1969, Ser. No. 790,641
Int. Cl. F02c 7/10
U.S. Cl. 60—39.51 6 Claims



Fuel injected into the compressed air upstream of the heat exchanger vaporizes and mixes with the air during passage through the heat exchanger. The fuel-air mixture is ignited as it emerges from the heat exchanger and burns within a short distance from the exit surface of the heat exchanger. Fuel is injected through nozzles upstream of the compressor or a slinger system associated with the rotating compressor.

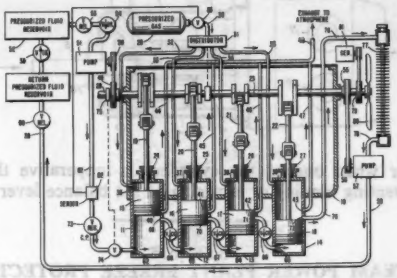
3,563,032

HYDROSTATIC PRESSURE PRIME MOVER

Ralph E. La Pointe, Box 1737, Anchorage, Alaska

Continuation-in-part of application Ser. No. 719,498, Apr. 8, 1968. This application Mar. 27, 1970, Ser. No. 23,411
Int. Cl. F01b 21/02
U.S. Cl. 60—49 10 Claims

A hydrostatic pressure operated prime mover having a block in which a conventional crankshaft is turned in response to the reciprocating displacement of a plurality of pistons in a like plurality of cylinder chambers, the pistons being subjected to the sequential action of two separate pressurizing fluids acting on opposite end faces of the pistons. One pressurized fluid is delivered sequentially to the cylinders from a first pressurized source and the resulting crankshaft rotation operates pump means to circulate the second pressurizing fluid. Since there is



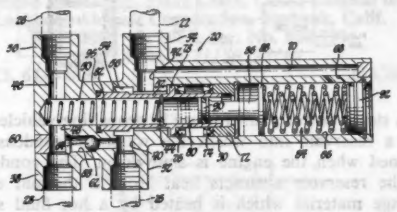
no combustion involved in operating this prime mover, pollution of the atmosphere is avoided.

3,563,033

FLUID SYSTEM CHARGING VALVE

Lee M. Brewer, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed June 19, 1969, Ser. No. 834,763
Int. Cl. F15b 1/02
U.S. Cl. 60—51 2 Claims



A recirculating fluid power steering system for automotive vehicles including a pump and a power steering gear unit is further provided with a secondary source of accumulator fluid pressure connected through the return line from the steering gear, and a charging valve operative in response to the decay of pressure fluid stored within the accumulator to a predetermined minimum to thereafter draw incoming pressure fluid from the steering gear return and pressurize the accumulator to a predetermined maximum whereafter the return line from the steering gear is again communicated to the power steering reservoir. The charging valve is provided with optimum bistable operating characteristics through use of telescopically related control valve and sensing plunger members including valving means operative over a limited travel range in the telescopic movement between the parts to cause snap-action movement of the control valve between accumulator charged and charging positions.

3,563,034

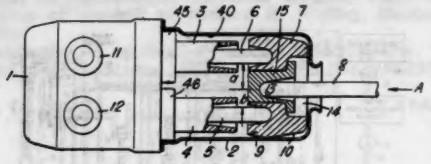
TWO-CIRCUIT MASTER BRAKE CYLINDER

Juan Belart, Walldorf, and Hans-Dieter Drahtmuller, Aschaffenburg, Germany, assignors to International Telephone and Telegraph Corporation, New York, N.Y., a corporation of New York

Filed Aug. 11, 1969, Ser. No. 849,122
Claims priority, application Germany, Aug. 16, 1968, P 17 80 218.5-21
Int. Cl. F15b 7/08
U.S. Cl. 60—54.5 4 Claims

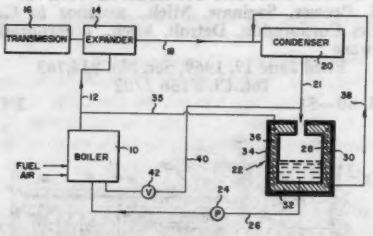
A two-circuit master cylinder assembly having two parallel cylinders operated by a balance lever having a fulcrum point against which an actuator operates. Stop

surfaces are provided on the balance lever and on the housing and/or actuator to limit rotation of the balance



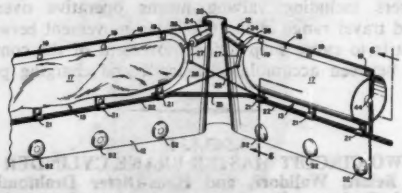
lever when one of the cylinders is inoperative thereby preventing binding or jamming of the balance lever.

3,563,035
STEAM POWER PLANT FREEZE PROTECTION SYSTEM
Leonard Raymond, New York, N.Y., assignor to Mobil Oil Corporation, a corporation of New York
Filed Oct. 3, 1969, Ser. No. 863,640
Int. Cl. F01k *7/44*
U.S. Cl. 60—88 **9 Claims**



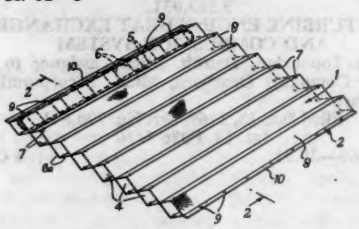
A steam power plant for use in propelling vehicles having a reservoir into which the water or condensate is drained when the engine is shut down. The condensate in the reservoir abstracts heat from a thermal energy storage material which is heated by a hot fluid stream from the steam power plant system during its operation. The heat stored in said material protects the water or condensate in the reservoir from freezing during non-use periods of normal duration at low ambient temperatures.

3,563,036
INFLATABLE FLOATING BOOMS
Millard F. Smith, Westport, Conn. (P.O. Box 295, Saugatuck, Conn. 06882) and Russell M. Blair, Westport, Conn.; said Blair assignor to said Smith
Filed Sept. 2, 1969, Ser. No. 854,626
Int. Cl. E02b *3/04, 15/04*
U.S. Cl. 61—1 **9 Claims**



Accordion-folding floating booms for confining spilled oil or other floating material incorporating a thin continuous flexible fin positioned vertically and provided with numerous, short, inflatable balloon-like float pockets mounted along its upper edge. The float pockets are all deflatable and collapsible for compact accordion-folded stowage of the boom in limited volumes of space for storage, shipment and delivery to the site by water transport or by airdrop. Automatic inflation of successive inflatable float pockets upon unfolding deployment of the booms is achieved by individual pressure sources actuated by the deployment process, providing inflation pressure to produce fully inflated expansion of the float pockets for buoyant floatation of the boom structure. Compressed gas charge cylinders triggered by unfolding of the boom supply the desired inflation pressure. Alternatively, chemical reactants enclosed in adjacent enclosures are mixed together upon unfolding deployment of the boom to produce sufficient amounts of gaseous reaction product to provide inflation pressures required for each buoyant balloon-like float pocket.

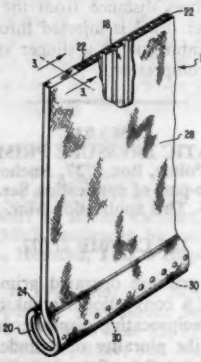
3,563,037
MINIMIZING SCOURING ACTION IN WATER FLOW CHANNELS
Albert James Stammers, 23 Shottfield Ave., East Sheen, London, SW. 14, England
Filed Dec. 17, 1968, Ser. No. 784,314
Claims priority, application Great Britain, July 18, 1968, 34,252/68
Int. Cl. E02b *3/04, 3/12*
U.S. Cl. 61—3 **9 Claims**



A means for minimising the scouring effect of water flow on the beds of rivers, estuaries and the sea bed comprising a tubular element composed of a meshed upper panel through which ballast material can pass to the interior of the element. If desired, the element may have a meshed lower panel through which sand or other bed material may pass but through which the ballast is unable to escape and a plurality of elements may be joined together in parallel relationship to form a unit.

The or each tubular element may be provided internally with a plurality of spaced apart distending members.

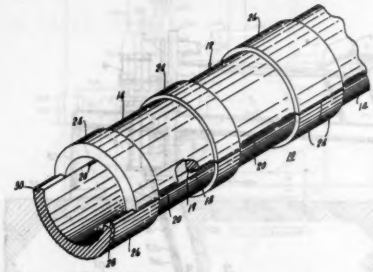
3,563,038
SUBTERRANEAN DRAIN
Kent A. Healy and Richard P. Long, Storrs, Conn., assignors, by mesne assignments, to Research Corporation, New York, N.Y., a foundation of New York
Filed Apr. 3, 1969, Ser. No. 812,982
Int. Cl. E02b *11/00*; B01d *35/02*
U.S. Cl. 61—11 **6 Claims**



A subterranean drain unit including a drain pipe having openings therein and a longitudinally extending planar

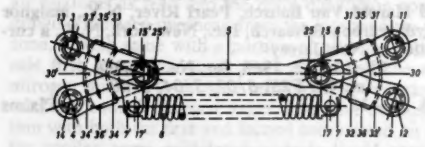
core defining channels normal to the pipe. Water pervious sheet material covering at least the core and the openings in the pipe to form a filter therefor.

3,563,039
DRAINAGE TILE STRUCTURE
John H. Olsen, 2736 E. Newton Ave., Milwaukee, Wis. 53211
Filed June 10, 1969, Ser. No. 831,830
Int. Cl. E02b *11/00*
U.S. Cl. 61—11 8 Claims



A drainage tile comprised of a pair of opposed sections. Slots are provided in the sides of the tile to allow water to enter the tile.

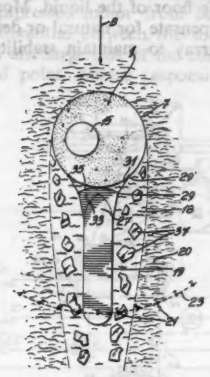
3,563,040
CONNECTING DEVICE FOR ROOF SUPPORT FRAMES
Konrad Grebe, 10 Kaiser Wilhelm Allee, 56 Wuppertal-Elberfeld, Germany
Filed Aug. 5, 1969, Ser. No. 847,584
Claims priority, application Germany, Aug. 8, 1968, P 17 58 794.9
Int. Cl. E21d *15/44*
U.S. Cl. 61—45 2 Claims



An improved connecting device between the upper and lower ends of a pair of upright support frames and intermediate sliding devices, respectively, in which two pairs of double swivel arms connect at their outer ends to the support frames and sliding devices respectively, and at their inner ends to a common pivot on the respective ends of a fishtail plate. A stop on one of each pair of arms limits rocking movement in one direction by contact with the fishtail plate and rocking movement of each of such arms in the opposite direction is resisted by a stop member, which is connected to the stop member of the other pair by a tension spring.

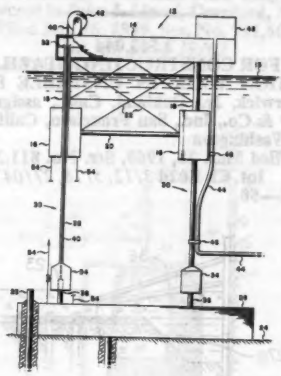
3,563,041
OFF-SHORE SHIP MOORING INSTALLATION
Bernard Michel, 739 Rue des Vignes, Ste.-Foy, Quebec 10, Canada
Filed Mar. 14, 1969, Ser. No. 807,236
Int. Cl. E02b *3/22*; E02d *27/36*
U.S. Cl. 61—46 5 Claims

An off-shore ship mooring installation made up of a wharf in the form of a columnar body built on the bottom of the sea and having a circular mooring head that projects above the sea in combination with a string of dolphins distributed on a circle circumscribing the mooring head and located away from the said head a distance



such as to allow mooring of the stern of one or more ships when the ships are moored to the head by the bow thereof.

3,563,042
ENCAPSULATED CABLE SYSTEM FOR ANCHORING A FLOATING PLATFORM
Carroll John Ryan, Santa Clara, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Mar. 19, 1969, Ser. No. 808,599
Int. Cl. B63b *21/50*, *35/44*
U.S. Cl. 61—46.5 24 Claims

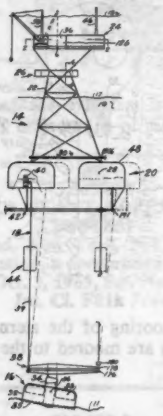


An encapsulated cable anchoring and tensioning system is provided for maintaining a floating platform on location with respect to an underwater installation. The platform is maintained on location by applying desired tension to a plurality of cables and their associated encapsulating tubing. The system includes method and apparatus for installing, preloading, adjusting and removing the encapsulated cable assemblies. The encapsulating tubes provide a means of reducing bending loads in the assembly and also protect the cables against corrosion, etc.

3,563,043
OCEANIC STATION
Arthur J. Nelson, 1998 Broadway, San Francisco, Calif. 94109
Filed Apr. 23, 1969, Ser. No. 818,621
Int. Cl. B63b *21/50*, *35/44*
U.S. Cl. 61—46.5 12 Claims

A vertical array disposed to selectively adjustable situations in a body of liquid supported by immersed buoyant

chambers of capacity in excess of the array weight, said excess opposed by cables uniformly tensioned by anchoring means to the floor of the liquid. Monitoring and control means compensate for natural or deliberately applied forces to the array to maintain stability and protective



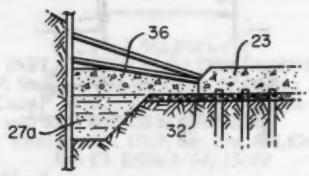
measures sustain reliability as a vertical assembly. Means are provided to cope with extending the cable to the floor at great depth. The cables are utilized solely as vertical load transmitting members with reliance on hydraulic means to oppose horizontal forces tending to displace the established vertical alignment of the array.

3,563,044

METHOD FOR CONSTRUCTING STABILIZED CONSTRUCTION WALL IN UNSTABLE FOOTING

Ben C. Gerwick, Jr., Oakland, Calif., assignor to J. H. Pomeroy & Co., Inc., San Francisco, Calif., a corporation of Washington

Filed Mar. 28, 1969, Ser. No. 811,331
Int. Cl. E02d *3/12, 5/18, 27/04*
U.S. Cl. 61—50 **7 Claims**



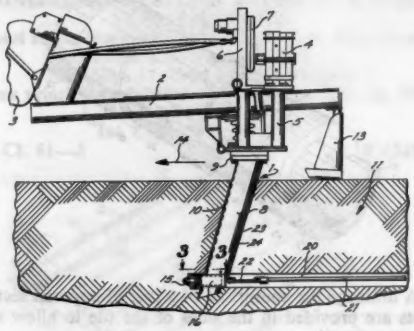
A method of providing stabilization for a construction wall during construction is an unstable footing includes the formation of a basin above the pre-existing surface level of a proposed construction zone or site. The basin is used to receive fluid therein to provide increased hydrostatic pressure, acting on the wall from inside the construction site to provide pressure within the site to a degree approximating the countervailing pressures acting on the construction wall from outside the site. Then, while maintaining the hydrostatic pressure, the soil materials within the site are removed by excavating down to a predetermined level and replaced (while still maintaining the hydrostatic pressure) with a stabilizing fill material of greater strength than the unstable material removed from the site. Thereafter, the hydrostatic pressure can be relieved and preparation of the site continued. The wall structure formed will ultimately be characterized by an unstable footing material on one side of the wall at the lower end thereof, a mat of stable footing material on the other side of the wall, and a mat of concrete superimposed upon the mat of stabilized footing material so that the concrete mat can counteract laterally acting forces pressing against the outside of the wall.

3,563,045

PIPE AND TUBING TRENCH DIGGER

Robert O. Hansen, 4549 W. Rosecrans, Hawthorne, Calif. 90250

Filed Nov. 1, 1968, Ser. No. 772,731
Int. Cl. F16l *1/00;* **E02f** *5/18*
U.S. Cl. 61—72.7 **2 Claims**



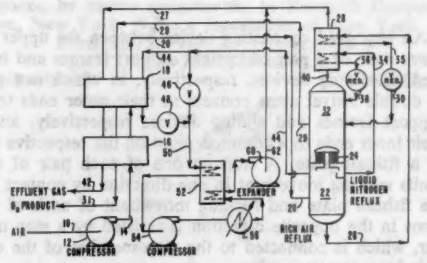
When it is desirable to bury certain pipe, tubing or cables which are used or employed by public utilities, it is necessary to dig a trench to receive these elements. With my plow a wide ditch is not required but, on the contrary, a relatively narrow trench is dug to the desired depth in the ground, and this trench or slot is easily recovered without the need of a wide open trench.

3,563,046

AIR SEPARATION PROCESS

Edward Harold Van Bausch, Pearl River, N.Y., assignor to Hydrocarbon Research, Inc., New York, N.Y., a corporation of New Jersey

Filed Jan. 5, 1968, Ser. No. 696,050
Int. Cl. F25j *3/02, 3/04, 5/00*
U.S. Cl. 62—13 **6 Claims**

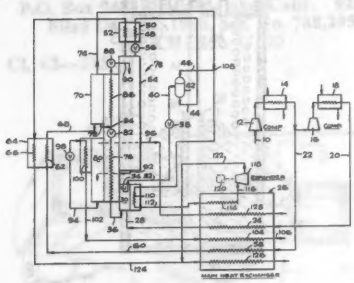


An improved air separation process wherein air is compressed, cooled by heat exchange with cold effluent gases from a low pressure distillation tower and then fractionated in a high pressure distillation tower, the condensation of the vapors from the high pressure tower being used to supply the heat to the low pressure tower and wherein refrigeration is obtained for the system by removing a vapor overhead stream from the high pressure tower, warming, compressing, removing the heat of compression, and subcooling the stream by heat exchange with the uncompressed portion of the stream and then passing the stream through an expander doing work.

3,563,047
PRODUCTION OF HIGH PURITY OXYGEN FROM AIR

Michael L. Hoffman, Beverly Hills, Calif., assignor, by mesne assignments, to McDonnell Douglas Corporation, Santa Monica, Calif., a corporation of Maryland

Filed Aug. 4, 1967, Ser. No. 658,501
Int. Cl. F25j *3/02, 3/08, 3/04*
U.S. Cl. 62—22 **11 Claims**



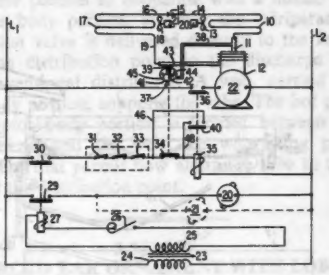
Process and system for producing high purity oxygen by air separation, which involves use of a high pressure air feed stream and an intermediate pressure air feed stream, and includes cooling both air feed streams approximately to saturation, separating the cooled high pressure air stream into liquid nitrogen and a first oxygen-rich liquid air mixture in a first separation zone, introducing a portion of said liquid nitrogen, after reducing the pressure thereof, as reflux into a main distillation zone at slightly above atmospheric pressure, separating the cooled intermediate pressure air feed stream in an intermediate pressure zone, into overhead nitrogen and a second oxygen-rich liquid air mixture, reducing the pressure of such first and second oxygen-rich liquid air mixtures, and introducing the resulting oxygen-rich liquid air mixtures as feed into the main distillation zone, withdrawing nitrogen overhead from the intermediate pressure zone, mixing same with a portion of nitrogen vapor from said first separation zone, work expanding the resulting nitrogen mixture to provide refrigeration, and passing the resulting cooled nitrogen vapor into heat exchange relation with both the first and second compressed air streams for cooling same, withdrawing crude liquid oxygen containing a minor portion of argon from the main distillation zone, separating the crude liquid oxygen in the argon separation zone, into high purity oxygen liquid and an argon-containing overhead, and vaporizing the high purity oxygen product; the main distillation zone, the high pressure and intermediate pressure separation zones, and the argon separation zone preferably being associated in heat exchange relation to provide suitable condensing and reboiling duty in each of such zones, and preferably under conditions to provide differential distillation in the main distillation zone and also in the other above-noted associated zones.

3,563,048
AUTOMATIC CONTROL FOR AN AIR CONDITIONING SYSTEM

Vincent T. Barry, Camillus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y., a corporation of Delaware

Filed Dec. 30, 1968, Ser. No. 787,888
Int. Cl. F25b *1/00*
U.S. Cl. 62—115 **8 Claims**

A control circuit for an air conditioning system including a refrigeration unit comprising a motor-driven compressor, a condenser, an evaporator, expansion means, and means to supply heat exchange media to the condenser and evaporator of said refrigeration unit. A pressure-actuated switch will prevent the circuit supplying power to operate the compressor motor from being energized if the pressure differential between the suction side of the compressor and discharge side of the compressor exceeds a predetermined point. Means responsive to a thermal

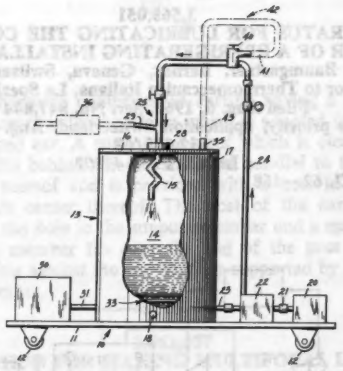


condition of the area being served by the system will energize the heat exchange medium supply means to the condenser even though the compressor may be inoperable because of an unsatisfactory pressure differential. The flow of heat exchange medium will substantially equalize the pressures enabling the compressor circuit to be completed.

3,563,049
ASPIRATOR AND CIRCULATING COOLING APPARATUS

Albert A. Schnerring, Neshanic, N.J., assignor of forty percent to John J. Lipari, Cranford, N.J.

Filed Jan. 16, 1969, Ser. No. 791,601
Int. Cl. F25b *19/02*
U.S. Cl. 62—170 **10 Claims**



Apparatus capable of use as an aspirator for drawing a constant vacuum and for use in circulating cooling systems. The apparatus is portable and includes an aspirator and means associated therewith for creating a vacuum at a controlled constant rate.

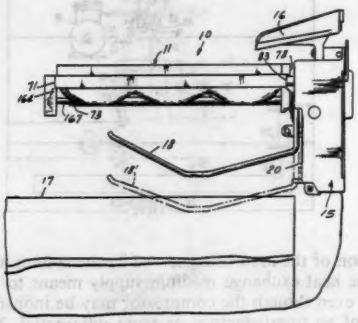
3,563,050
AUTOMATIC ICE MAKER

William L. Fox, Niles, Ill., assignor to Eaton Yale & Towne Inc., a corporation of Ohio

Filed Sept. 26, 1968, Ser. No. 762,891
Int. Cl. F25c *1/10*
U.S. Cl. 62—233 **15 Claims**

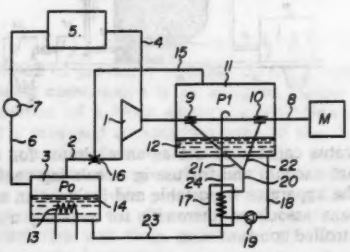
A completely automatic ice cube maker which is driven through successive water fill cycles, freeze cycles and

harvest cycles by a continuously operating permanent magnetic synchronous electric motor. Water is delivered to a plastic ice cube tray during the water fill cycle and the water in the tray is frozen during a freeze cycle of predetermined duration. During the harvest cycle the tray is rotated about its longitudinal axis through 360° but at approximately the mid-point of this rotation one end



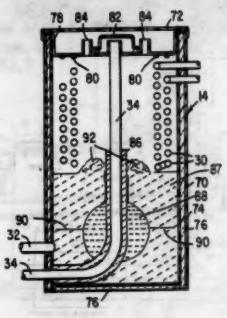
of the tray is arrested momentarily in its movement whereby a twisting action is applied to the tray to dislodge the cubes therefrom. The cubes drop into an ice collection basket and prior to each harvest cycle an ice level sensing mechanism operates to determine whether an excessive quantity of cubes have been collected in the basket and if so operates to deenergize the ice cube maker until the quantity of cubes in the basket has been reduced.

3,563,051
APPARATUS FOR LUBRICATING THE COMPRESSOR OF A REFRIGERATING INSTALLATION
Henri Baumgartner, Bernex, Geneva, Switzerland, assignor to Thermomeccanica Italiana, La Spezia, Italy
Filed Aug. 6, 1969, Ser. No. 847,844
Claims priority, application Switzerland, Aug. 13, 1968, 12,170/68
Int. Cl. F25b *43/02*
U.S. Cl. 62—468 **4 Claims**



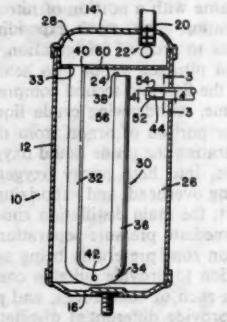
For lubricating the compressor of a refrigerator installation operating on a compression cycle, the upper part of the compressor casing is connected to the suction side at a point where the pressure is lower than that in the evaporator, a heat exchanger is connected to the evaporator and to said upper part, and oil is pumped through the heat exchanger to cool it and is then conveyed to the bearings.

3,563,052
FREEZE CUSHION FOR ABSORPTION REFRIGERATION MACHINE
Earl L. Brown, Indianapolis, Ind., assignor to Carrier Corporation, Syracuse, N.Y., a corporation of Delaware
Filed Sept. 3, 1968, Ser. No. 756,810
Int. Cl. F25b *15/04*; F28f *19/04*
U.S. Cl. 62—476 **2 Claims**



An absorption refrigeration machine employing a water chiller with a central resilient column which is deformable by water pressure created by freezing of the water in the chiller to provide a passage for flow of water from the interior of the ice block formed in the chiller to prevent damage to the chiller caused by expansion of the ice.

3,563,053
SUCTION ACCUMULATOR
Edward W. Bottum, 9357 Spencer, Brighton, Mich. 48116
Filed Sept. 16, 1968, Ser. No. 759,863
Int. Cl. F25b *43/00*
U.S. Cl. 62—503 **16 Claims**



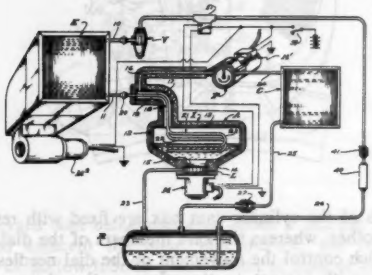
The suction accumulator of the invention is designed for use with the suction or compressor side of a refrigeration system. The accumulator comprises a casing having an inlet and an outlet. A conduit is provided within the casing. The conduit extends from a point adjacent the bottom of the casing to the casing outlet and acts as a suction tube to draw liquid from the casing and expel it into the casing outlet at a metered rate. The conduit is preferably a generally U-shaped tube which has a first leg connected to and extending from the outlet towards the lower portion of the casing and a second leg extending from the first leg towards the upper

portion of the casing and terminating in an open end for the passage of gas therethrough. The U-shaped tube has an opening adjacent the lower portion of the casing to draw liquid from the casing and expel it into the casing outlet at a metered rate.

3,563,054
REFRIGERATION SYSTEM WITH LIQUID SEPARATOR

Andrew F. Lofgreen and Harley L. Coggburn, both of P.O. Box 948, Big Bear Lake, Calif. 92315

Filed Dec. 31, 1968, Ser. No. 788,295
Int. Cl. F25b *43/00*
U.S. Cl. 62—512 6 Claims

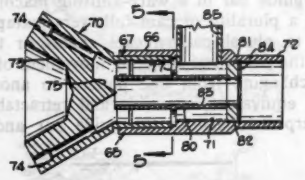


A refrigeration system wherein a conventional compressor or a generator boiler is replaced by a novel liquid vapor phase separator and a small capacity vapor pump, said liquid vapor phase separator being thermally insulated and having heat transfer means within to lower and control the operating temperature of the liquid vapor phase separator, said vapor pump serving to evacuate vapor from the separator and deliver it to a condenser to condense it and subsequently deliver it to a receiver, said liquid pump drawing liquid refrigerant from the separator and delivering it to the receiver.

3,563,055
REFRIGERANT DISTRIBUTOR

Alan Owens, Ballwin, Mo., assignor to Sporlan Valve Company, St. Louis, Mo., a corporation of Missouri

Filed Mar. 17, 1969, Ser. No. 807,668
Int. Cl. F25b *39/02*
U.S. Cl. 62—525 10 Claims



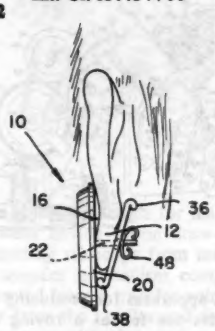
A refrigerant distributor for delivering refrigerant from an expansion valve to a multi-circuit evaporator, the distributor having a nozzle in a body chamber through which the liquid/gas mixture leaving the expansion valve is fed from a first inlet in one body end to a plurality of divergent feed passages in the opposite body end. The nozzle includes a tube that extends forwardly in the chamber to a point of distribution in the chamber. A second inlet in the body side communicates with the chamber in front of the nozzle partition yet rearwardly of the tube end so that hot refrigerant gas is mixed in the chamber around the tube and then fed into the feed passages at the distribution point.

An adaptor body portion that is compatible with a conventional distributor can be inserted between the expansion valve and such distributor. The nozzle of the conventional distributor is removed and inserted in the body adaptor portion to cooperate with a nozzle tube in the adaptor body portion, whereby the refrigerant from the expansion valve is delivered directly to the feed passages at the distribution point in the discharge portion of the conventional distributor. A web, carried by the adaptor body portion, supports the tube. The hot gas inlet in the adaptor body portion is located between the insertable nozzle and the web, the web being provided with openings that permit flow along the tube to the feed passages at the distribution point.

3,563,056
PIERCED EAR ORNAMENT WITH LOBE SUPPORT MEANS

Hazel H. Noel, 42 W. 35th St., New York, N.Y. 10001

Filed Mar. 26, 1969, Ser. No. 810,506
Int. Cl. A44c *7/00*
U.S. Cl. 63—12 9 Claims



The invention comprises an earring having a post extending rearwardly therefrom which is adapted to fit into the pierced ear. A support member which is elongatedly shaped fits behind the ear and runs parallel to the back surface thereof and is provided with a hole in the approximate center thereof. The post of the earring fits through the hole in the support member and a spring-like securing member fits over the end of the post holding the earring against the ear which is supported by the support member.

3,563,057
METHOD FOR MAKING MULTIFOCAL LENS

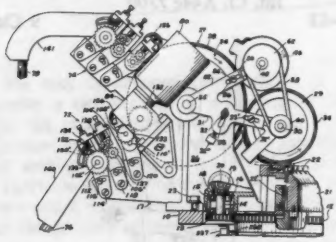
Charles H. Rosenbauer, Irondequoit, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y., a corporation of New York

Continuation of application Ser. No. 518,272, Jan. 3, 1966. This application Aug. 28, 1968, Ser. No. 757,220
Int. Cl. C03b *15/00, 11/08*
U.S. Cl. 65—30 2 Claims

A method of making a multi-focus lens. Selected ions (silver or thallium) are diffused through the surfaces of a recess into a glass blank having the same index

of refraction as the base element of the lens. The diffused ions form a zone of gradient refractive index adjacent to the surfaces of the recess. A segment glass of higher refractive index than the initial blank is then fused in the recess to form a composite disc. The portion of the blank beneath the recess is removed to expose the segment glass. The composite disc is then shaped to the required curvature and fused to the base element.

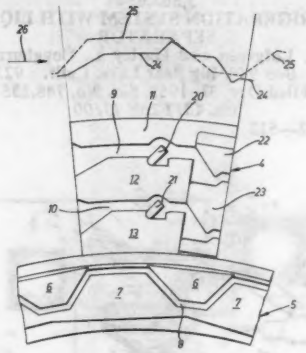
3,563,058
METHOD AND APPARATUS FOR PRODUCING KNIT PILE FABRIC
Arnold W. Schmidt, Sarasota, Fla., assignor to Norwood Mills, Inc., Janesville, Wis., a corporation of Delaware
Application Dec. 9, 1966, Ser. No. 600,490, now Patent No. 3,501,812, dated Mar. 24, 1970, which is a division of application Ser. No. 332,227, Dec. 20, 1963, now Patent No. 3,299,672, dated Jan. 24, 1967. Divided and this application June 20, 1969, Ser. No. 835,155
The portion of the term of the patent subsequent to Jan. 24, 1984, has been disclaimed
Int. Cl. D04b *9/14*
U.S. Cl. 66—9 **8 Claims**



A method and apparatus for producing knit pile fabric wherein pile fibers are fed as a roving or sliver by a feeding and drafting section, driven by a variable speed electric motor, to the main cylinder and doffer of a carding head which in turn cards and feeds the fibers to the needles of a rotary cylinder knitting machine. The drafting section motor drive is independent of the head and machine drive, and is controllable and variable during running and/or set-up to permit gradual speed variation and/or speed selection.

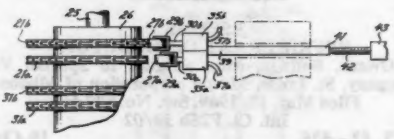
3,563,059
CIRCULAR KNITTING MACHINE WITH MULTIPLE STRIPING MEANS
Johann Martinetz, Hechingen, Germany, assignor to Mayer & Cie, Tailfingen, Germany, a firm
Filed Apr. 2, 1969, Ser. No. 812,711
Claims priority, application Germany, Apr. 17, 1968, P 17 60 196.6
Int. Cl. D04b *9/06, 15/48*
U.S. Cl. 66—19 **3 Claims**

An improved arrangement for introducing striping threads into a circular knitting machine during the operation thereof. The arrangement comprises a plurality of thread insertion fingers which are operatively mounted adjacent to the cylinder cam box of the circular knitting machine. A preselected thread insertion finger is adapted to guide a striping thread into an operative position in which it can be engaged by a catch hook which is operatively mounted in the dial of the circular knitting machine. The movement of the catch hook is guidingly controlled by a cam member mounted on the dial of the circular knitting machine. This cam member is fixed with respect to the cylinder cam box, whereas the dial cam members which guide the dial needles are movably mounted in the dial cam box ring so that they may be moved from a normal knitting position to a delayed-timing knitting position. Consequently, the positions of the cam member for controlling the movement of the catch hook and the cam



members of the cylinder cam box are fixed with respect to each other, whereas the cam members of the dial cam box, which control the movement of the dial needles, are movable with respect to the aforementioned two cam members.

3,563,060
MACHINE KNITTING
Seymour C. Titone, Birchrunville, Pa., assignor to Titone Research & Development Corporation, Burlington, N.J.
Continuation-in-part of application Ser. No. 694,655, Dec. 29, 1967. This application June 4, 1968, Ser. No. 734,331
Int. Cl. D04b *27/28*
U.S. Cl. 66—86 **18 Claims**

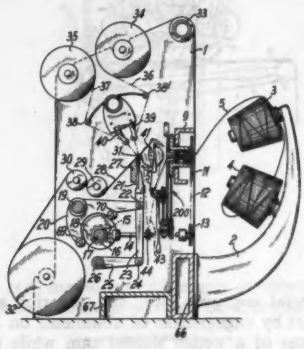


A yarn guide bar in a warp-knitting machine is provided with a plurality of cam followers juxtaposable respectively to plural pattern cam chains or the like to determine the pattern of shogging movement of the guide bar. Interchanging from one pattern to another is by pistons or equivalent extensible and retractable mechanisms interposed between the guide bar and the cam followers.

3,563,061
WARP KNITTING MACHINE
Stefan Fürst, Monchen-Gladbach, Germany, assignor to Walter Reiners, Monchen-Gladbach, Germany
Filed Aug. 4, 1969, Ser. No. 847,063
Claims priority, application Germany, Aug. 6, 1968, P 17 85 063.4-26
Int. Cl. D04b *23/00*
U.S. Cl. 66—86 **5 Claims**

Warp knitting machine having a zone wherein knitting needles are disposed and means for supplying warp threads to the needles includes device for filling a weft having holder members rotatable in closed travel paths

outside the needle zone and disposed in the vicinity of weft reversal locations, means for guiding the weft to the warp threads, and a thread guide cooperating with the holder members for making the weft ready, the thread guide being located at one end of a rod bent in the form



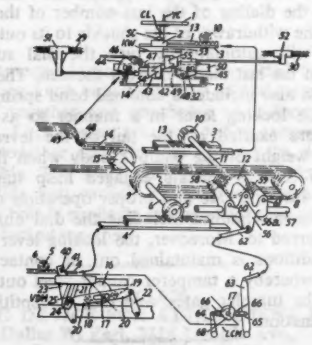
of a crank and being rotatable about a bearing portion located adjacent the other end thereof, the bent rod being of hollow tubular construction at least at the bearing portion thereof and being formed of at least two parts angularly adjustable relative to one another.

3,563,062

SLUR AND CARRIER DRIVE MECHANISMS FOR FULLY FASHIONED FLAT BAR KNITTING MACHINES

Ernest West, Kirkby-in-Ashfield, and Frederick R. Challenger, Loughborough, England, assignors to S. A. Monk (Sutton-in-Ashfield) Limited, Sutton-in-Ashfield, England, a British company

Filed July 14, 1969, Ser. No. 841,453
Claims priority, application Great Britain, July 20, 1968, 34,743/68
Int. Cl. *15/52*
U.S. Cl. 66—126 **10 Claims**



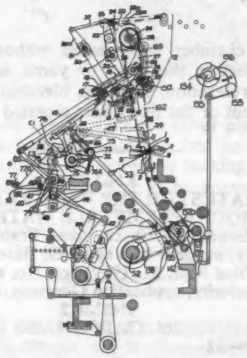
Straight-bar knitting machine having a yarn carrier drive driven from variable draw mechanism over minimum distances only slightly in excess of those required for carriers to traverse the knitting width in either direction, and a differential is provided for imparting an extra linear movement to a slur cam box tie bar each time the carrier rod is arrested by a stop, thereby achieving a lead of the carriers ahead of the slur cams. The differential preferably includes a chain sprocket which is engaged with a slur draw chain and is secured upon a shaft to which is also secured a pinion arranged in mesh with a slur drive rack. This shaft turns in a guided slipper connected with lead changeover means.

3,563,063

STRAIGHT BAR KNITTING MACHINES

Raymond Blood, Shepshed, and Peter LeGood and Alan John Pearson, Loughborough, England, assignors to William Cotton Limited

Filed Aug. 26, 1968, Ser. No. 755,316
Claims priority, application Great Britain, Sept. 1, 1967, 39,997/67
Int. Cl. D04b *9/40*
U.S. Cl. 66—148 **12 Claims**



A straight bar knitting machine for making pressed off ribs or turned welts having fabric draw-off mechanism, means for transferring rib loops from machine to frame needles, fabric transfer mechanism comprising lift and pusher arms operated from a transfer point bar to receive the ribs or welts from the needles and for delivering the ribs or welts to an upper location, with cutter and trapper mechanism for trailing yarn, and wherein there is in each division a magazine point bar unit under operational control of cams on an upper cam shaft driven through a revolution clutch from the machine's machine cam shaft, each unit having a removable magazine point bar and transfer elements which are cam controlled for transferring each of a plurality of ribs or welts, elevated by the transfer point bar mechanism, from the transfer point bars to the magazine point bars, including a cam operated tray-like fabric guide for the ribs or welts, switch control means for independent motor control of the transfer point bar mechanism, and a graduated control cam for the magazine point bar unit to deal with ribs or welts of different lengths.

3,563,064

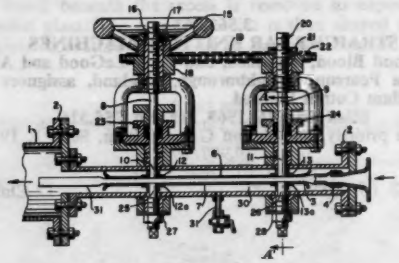
PRESSURE SEALING APPARATUS FOR PROCESSING OF FIBERS IN TOW FORM

Masahide Yazawa, Tokyo, Japan, assignor to Polymer Processing Research Institute Ltd., Tokyo, Japan, an organization of Japan

Filed Apr. 30, 1969, Ser. No. 820,416
Claims priority, application Japan, Jan. 24, 1969, 44/5,380
Int. Cl. D06f *37/00*
U.S. Cl. 68—5 **10 Claims**

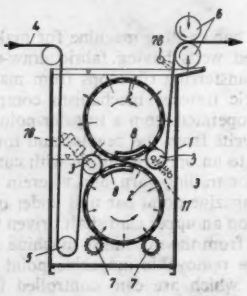
Apparatus for sealing a high pressure continuous processing chamber for fibers or yarns in tow-form, from the outside atmosphere, the principal part of which is a tube connected to said high pressure processing chamber, made of a practically elastic material and installed in a protecting pressure chamber and the cross-sectional area of

said tube relative to the total cross-sectional area of fibers passing said tube being reducible by controlling the gap of a set of two plates which are positioned along said small tube so as to clamp said small tube, whereby leakage resistance of pressurized gas from the high pressure



processing chamber is increased without affording any harmful effect to the fibers or yarns, said processing is stretching, relaxation, scouring, bleaching, dyeing, chemical treatment or the like under elevated temperature and pressure.

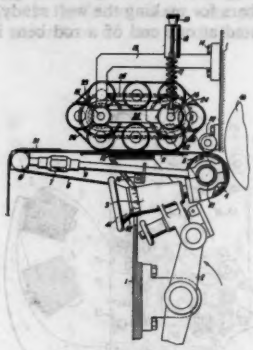
3,563,065
APPARATUS FOR THE WET-TREATMENT OF LIQUID-PERMEABLE MATERIALS
Heinz Fleissner, Egelsbach, near Frankfurt am Main, Germany, assignor to Vepa AG, Basel, Switzerland
Filed Sept. 21, 1967, Ser. No. 669,573
Claims priority, application Germany, Sept. 24, 1966, V 32,012
Int. Cl. D06f *31/00*
U.S. Cl. 68—22 **15 Claims**



The present disclosure relates to a process and apparatus for the wet-treatment of liquid-permeable materials such as tow, slivers, yarn, woven and knitted fabrics, needled felts and tufteds, non-wovens and the like. More particularly, the present invention concerns a process and apparatus for the wet-treatment of textile materials wherein the material being treated is passed on an extended path through the treatment bath thus exposing said material to the influence of the treatment liquid for a longer period of time without substantially increasing the space required for such treatment devices.

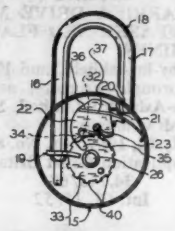
3,563,066
SPREADING MECHANISM FOR HIDES, SKINS, OR LEATHER
Karel Baják, Jan Zdražil, and Miroslav Sparel, Krnov, Czechoslovakia, assignors to Strojosvit, narodni podnik, Krnov, Czechoslovakia
Filed Nov. 27, 1968, Ser. No. 779,569
Int. Cl. C14b *1/08*
U.S. Cl. 69—1 **5 Claims**

A spreading mechanism for feeding tanned hides or skins to a fluffer has a conveying belt and paired spreading rollers freely rotatable on shafts held between chains. The chains are driven in such a manner that the rollers move along a carrier face of the belt against the direction of movement of the latter. The rollers of each pair have



circumferential engaging ribs, and the ribs are moved axially apart by engagement of abutments on the rollers and the faces of a wedge shaped cam while the rollers move along the carrier face.

3,563,067
PERMUTATION PADLOCK MECHANISM
Daniel J. Foote, Milwaukee, Wis., assignor to Master Lock Company, Milwaukee, Wis., a corporation of Wisconsin
Filed Feb. 7, 1969, Ser. No. 797,497
Int. Cl. E05b *37/00, 37/06*
U.S. Cl. 70—25 **3 Claims**

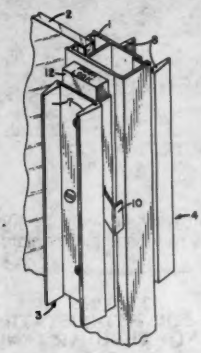


This permutation padlock contains mechanism which, following the dialing of the last number of the combination and the withdrawal of the shackle to its outer released position, will automatically turn the dial substantially away from the last dialed number thereon. The improved mechanism also includes a confined band spring engaging the shackle locking lever in a manner so as to relieve the pressure exerted on the tail of the lever resulting from the weight of the padlock body when the same is suspended from a shackle engaged hasp staple or the like, thus insuring free and proper operation of the padlock release mechanism including the dial number upset above referred to. Moreover, the locking lever tail under these conditions is maintained out of contact with the tumblers whereby a tamperer cannot "feel out" the positions of the tumbler gates, and thus surreptitiously, find the combination.

3,563,068
LATCH MECHANISM FOR SLIDING DOORS
Raymond N. Dushane, Jr., Fullerton, Calif., assignor to H & D, Inc., Everett, Wash., a corporation
Filed Oct. 21, 1968, Ser. No. 769,249
Int. Cl. E05b *65/08*; E05c *19/12*
U.S. Cl. 70—100 **12 Claims**

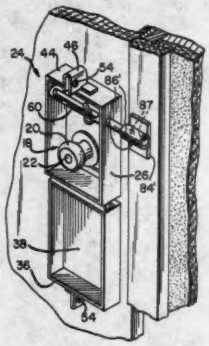
A latch mechanism for a sliding door in which a latch hook, mounted on the door stile, is caused to pivot about a vertical axis to engage a continuous vertical

flange mounted on the doorjamb. A vertically, linearly slideable, elongated shuttle, mounted on the door stile,



includes a cam member which opens or closes the latch hook when the shuttle is elevated or depressed.

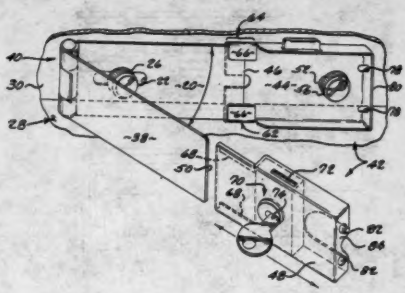
3,563,069
SAFETY LOCK FOR DOORS
Armando Ferrer, 59 NW. 28th St., Miami, Fla. 33127
Filed July 7, 1969, Ser. No. 839,438
Int. Cl. E05b *59/00, 13/00;* E05c *13/02*
U.S. Cl. 70—129 5 Claims



A supplemental locking device is provided for a door having a door knob consisting of a pair of frames which are hinged together and attachable to a door over the door knob. Lock means are provided to secure the pair of frames together and when so secured the door knob is inaccessible. The supplemental locking device also includes a slide bolt carried by the door attached frame which slide bolt is similarly inaccessible when the pair of frames are locked together.

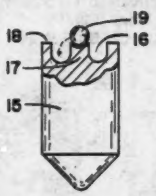
3,563,070
LOCKING DEVICE FOR ATTACHMENT MEANS
Dallas W. Earl, 3216 Laclede Ave., Los Angeles, Calif. 90039
Filed Jan. 10, 1969, Ser. No. 790,354
Int. Cl. E05b *73/00;* F16b *41/00*
U.S. Cl. 70—232 9 Claims

The specification discloses a locking device for threaded attachment means, usually adapted to attach an auxiliary supportable object, such as a tape playing transducer means, although not specifically so limited, with respect to an auxiliary mounting structure which, in certain forms, may be a mounting bracket attached underneath the instrument panel of a motor vehicle, although not specifically so limited in all forms of the invention. The locking device includes a base plate member and a cover plate member adapted to be attached to such an auxiliary supportable object and to such an auxiliary mounting structure and to effectively protect and cover such threaded attachment means so as to prevent the unauthorized dis-



engagement thereof except when the cover plate member is moved from a protective position into an open position, which is normally prevented by locking means cooperating therewith and adapted to be normally locked but to be controllably unlockable by an authorized person in the event that the auxiliary supportable object is to be disengaged from the auxiliary mounting structure.

3,563,071
LOCK WITH CHANGEABLE COMBINATION
Larry N. Barger, 460 W. Doran, 117, Glendale, Calif. 91203
Filed Sept. 22, 1969, Ser. No. 859,638
Int. Cl. E05b *15/14, 25/00*
U.S. Cl. 70—383 10 Claims

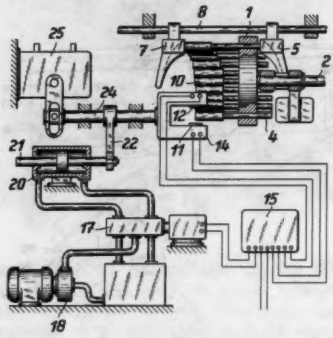


A cylinder-type door lock which can be actuated by two different keys—a construction worker's key and a home owner's key. During construction of the house, plumbers, electricians and other construction workers can each have a construction key to enter the house. When the house is sold and the owner inserts his key for the first time, the lock's combination is permanently changed so that the construction keys will no longer operate the lock. The lock has a special tumbler which is altered when the owner uses his key for the first time.

3,563,072
CONTROL SYSTEM FOR THE AUTOMATIC CONTROL OF FLUCTUATIONS AND STABILIZATION OF STRIP THICKNESS IN CONTROL ROUTES
Helmut Kunig, Reinbek, Karl-Heinz Plehl, Geesthacht, and Walter Clementsen, Hamburg, Germany, assignors to Hanseatische Motoren-Gesellschaft m.b.H., Hamburg, Germany
Filed June 18, 1968, Ser. No. 737,901
Int. Cl. B21b *37/02*
U.S. Cl. 72—39 6 Claims

The invention relates to a control system for the automatic control of fluctuations and the stabilization of strip thickness, which system comprises a plate and pins axially displaceable in the plate with said fluctuations, the

amount of this displacement serving as a reference quantity for the deviation from nominal thickness. The axial position of each pin after displacement is scanned photoelectrically. The produced electrical signals are converted to mechanical movements for readjusting the strip thickness to its nominal value. This system allows sensing the strip thickness with only small roll pressure and simple transformation of the weak force available from the sensing operation into the strong forces required for mechanical stabilization of strip thickness.

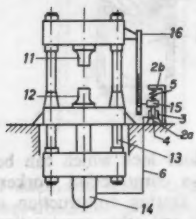


3,563,073

DEVICE FOR COMPENSATING FOR THE SPRINGING IN MACHINES, PARTICULARLY IN FORGING PRESSES AND THE LIKE

Rolf Fischer, Buderich, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany, a company of Germany

Filed Mar. 12, 1968, Ser. No. 712,548
Claims priority, application Germany, Mar. 14, 1967, Sch 40,390
Int. Cl. B21j 9/20
U.S. Cl. 72—31 1 Claim



A device to indicate the springing in hydraulically operated plant, particularly in forging presses, wherein the travel of a movable part of the plant relative to a stationary part is measured by means of a stationary travel-indicator which includes a movable element which is displaceable in and opposite to the direction of the stroke movement of the movable machine part.

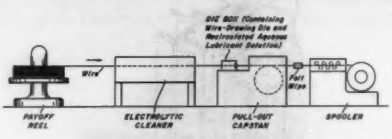
3,563,074

METHOD OF MAKING ELECTRIC WELDING WIRE HAVING EXTENDED SHELF LIFE

Samuel C. Avallone, Westlake, Ohio, assignor to United States Steel Corporation, a corporation of Delaware

Continuation-in-part of application Ser. No. 689,244, Dec. 7, 1967, which is a continuation-in-part of application Ser. No. 630,294, Apr. 12, 1967. This application Jan. 29, 1970, Ser. No. 6,929
Int. Cl. B21b 45/02
U.S. Cl. 72—39 6 Claims

A bright-finish weld-wire for electric welding purposes and the method of making such wire which includes cleaning a length of steel wire by acid-electrolytic treatment and then cold-drawing it through a diamond die using as



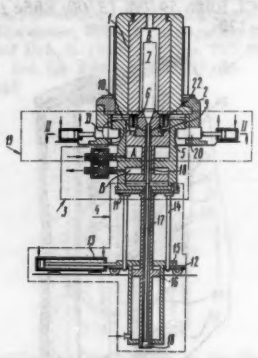
a wire-drawing lubricant an aqueous solution of water-soluble soap and a water-soluble inorganic rust inhibitor.

3,563,075

INSTALLATION FOR HYDROSTATIC EXTRUSION OF RODS AND TUBULAR AND PROFILED ARTICLES

Boris Ivanovich Beresnev, Evgeny Dmitrievich Martynov, Mikhail Vasilievich Maltsev, Georgy Pavlovich Britnev, Anatoly Vasilievich Kocherov, Konstantin Ivanovich Ezersky, and Vladimir Ivanovich Monakhov, Moscow, U.S.S.R., assignors to Institut Fiziki Metallov, Sverdlovsk, U.S.S.R.

Filed Jan. 5, 1968, Ser. No. 695,917
Int. Cl. B21c 23/04
U.S. Cl. 72—60 10 Claims



Extrusion apparatus comprises a frame carrying a container having a chamber in which a blank can be inserted and hydrostatic fluid pressure can be developed to extrude the blank through a die which is positionable against the container. The die is pressed against the container by a hydraulic drive which is displaceable both longitudinally and transversely of the chamber. In the course of extrusion, a locking device couples the hydraulic drive and the container via the frame. The piston of the hydraulic drive has a bore through which the extruded article may pass during the extrusion operation.

3,563,076

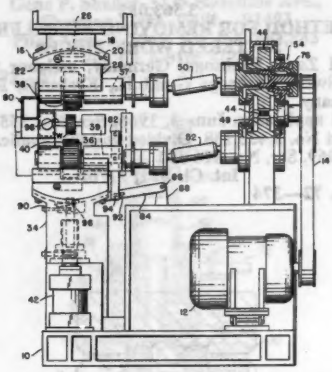
SETUP METHOD FOR GEAR ROLLING

David W. Daniel, Birmingham, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif., a corporation of Delaware

Filed Feb. 26, 1969, Ser. No. 802,339
Int. Cl. B21h 5/00
U.S. Cl. 72—108 7 Claims

Method of setting up gear rolling apparatus using a plurality, preferably two, opposed roll dies driven in a single direction by a gear train, including an input drive gear, interconnecting said dies. A work gear centered on an arbor between the dies is brought into tight mesh

with the dies, establishing backlash between one or more gears in the gear train connecting the dies. The arbor is removed, and the input drive gear is rotated slowly in the direction in which it will rotate during gear rolling. Rotation of the dies is opposed by brake action. If the timing of the gears in the gear train is not correct, the



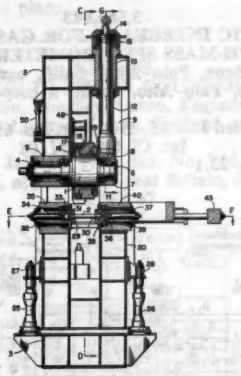
work gear will shift laterally of the line joining the axes of said dies in one direction or the other. One of the dies is then angularly adjusted relative to the other die through appropriate gear train adjustment until the work gear is again central, thus establishing the correct timing relationship.

3,563,077

ROLLING MILL FOR ROLLING BUSHES AND THE LIKE

Wolfgang Backé, Aachen, and Otto Ulrych, Dortmund-Horde, Germany, assignors to Rheinstahl Wagner Werkzeugmaschinenfabrik m.b.H., Dortmund, Germany

Filed Mar. 6, 1969, Ser. No. 804,783
Claims priority, application Germany, May 15, 1968, P 17 52 361.4
Int. Cl. B21h *1/00*; B21b *13/14*
U.S. Cl. 72—108 **11 Claims**



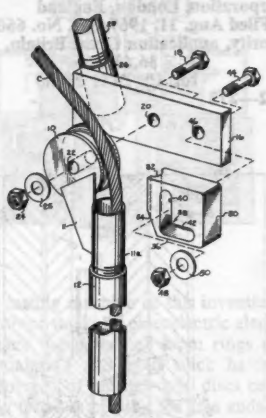
A mill for rolling annular workpieces, such as bushes and the like, whose axial lengths are large relative to their diameters, has two superposed relatively adjustable horizontally oriented rolls supported at opposite ends, with the larger diameter upper roll being driven and the smaller diameter lower roll being axially displaceable. Respective bearings rotatably support each end of each roll, and a drive is connected to one end of the upper roll. A support frame is closed above and beneath the rolls and encloses the bearings. The bearing at the drive end of the upper roll is fixedly mounted in the frame, and a displaceable bearing block on the frame engages the top and sides of the bearing at the other end of the upper roll and is vertically adjustable. A carriage is mounted on the frame for adjustment relative to the upper roll and carries the bearings at the ends of the lower roll.

3,563,078

BENDING DEVICE

Henry N. Mastalski, Lakewood, Ohio, assignor to The Fanner Manufacturing Company, a division of Textron Inc., a corporation of Rhode Island

Filed July 23, 1968, Ser. No. 746,945
Int. Cl. B21d *7/02*
U.S. Cl. 72—217 **1 Claim**



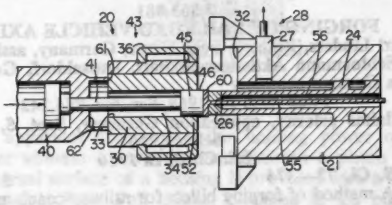
A strand bending device which has a mandrel connected to one handle. A second handle is detachably mounted on a pivot arm, which pivot arm is pivotally mounted on the first handle. The pivot arm also mounts a cable engaging shoe. The shoe has an L-shaped slot and a bolt mounts the shoe on the pivot arm for sliding movement between a cable engaging position and a cable removal position. The handle connected to the mandrel is hollow and positioned to have the end of the cable disposed therein during bending thereby acting both as a handle for operating the device and retainer for the cable holding it in place during bending, which is accomplished by relatively rotating the handles.

3,563,079

INDIRECT EXTRUSION WITH SKULL SKIMMING

George E. Monie, Henrico, and Warren G. Whiting, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va., a corporation of Delaware

Filed Nov. 21, 1968, Ser. No. 777,621
Int. Cl. B21c *23/00*
U.S. Cl. 72—255 **7 Claims**



A method of indirectly extruding a metal billet disposed in a container mounted between a die means and a container blocking means by applying compressive forces to

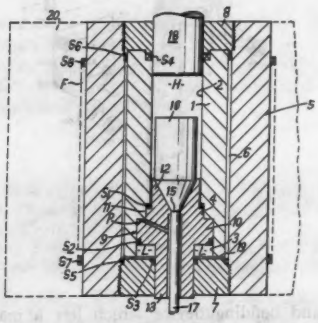
opposite ends of the billet through the blocking and die means so that relative movement of at least one of the die and blocking means toward the other will extrude the billet through the die means wtih the blocking means and die means ending up nearing one end of the container. Thereafter removing the unextruded billet residue from the container by moving both the blocking means and the die means to the other end of the container.

3,563,080

HIGH PRESSURE CONTAINERS FOR CYCLICALLY VARYING PRESSURES

John Malcolm Alexander and Bela Lengyel, London, England, assignors to National Research & Development Corporation, London, England

Filed Aug. 11, 1967, Ser. No. 660,056
Claims priority, application Great Britain, Aug. 15, 1966, 36,455/66
Int. Cl. B21c *27/00*
U.S. Cl. 72—272 **8 Claims**



A high pressure container, for example for hydrostatic extrusion has a plunger for generating high hydrostatic pressure in the container and also has a movable wall portion defined by a surface of a floating movable member. An opposite surface of the floating member of larger area forms a movable wall surface in a lower pressure chamber. Consequently, the pressure in the lower pressure chamber is always less than but proportional to the pressure in the high pressure chamber. The lower pressure thus generated is applied around the outer cylindrical wall surface of the high pressure chamber. In this way, tensile hoop stresses in the cylindrical wall can be eliminated throughout a working cycle within the high pressure chamber. The life of the high pressure chamber is increased since the risk of fatigue failure is reduced.

3,563,081

FORGING OF RAILROAD VEHICLE AXLES

Karl Linders, Buttgen, near Neuss, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany, a German company

Filed Aug. 21, 1968, Ser. No. 754,242
Claims priority, application Germany, Sept. 5, 1967, Sch 41,260
Int. Cl. B21k *1/10*
U.S. Cl. 72—374 **3 Claims**

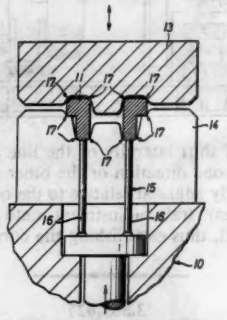
A method of forging billets for railway-coach axles, the diameter of the axle between the wheel seats being either the same as the diameter of the journals or different, wherein the billets are first forged to round material of a diameter equal to the finish-forged diameter of the wheel seats, and the round material is then finish-forged in a drop-forging press in at least two working strokes, a portion of the round material of a length at least equal to the distance between the wheel set upon the round material being finish-forged in one stroke.

3,563,082

METHOD FOR REMOVING BURRS FROM SINTERED WORK PIECES

Gerhard Zapf, Krebsoge, Germany, assignor to Sintermetallwerk Krebsoge G.m.b.H., Krebsoge, Rhineland, Germany

Original application June 3, 1966, Ser. No. 555,138, now Patent No. 3,455,138. Divided and this application Feb. 24, 1969, Ser. No. 816,860
Int. Cl. B21j *11/00*
U.S. Cl. 72—374 **3 Claims**



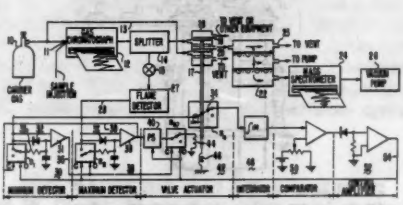
The disclosure relates to a method of forming sintered workpieces. The disclosed process sinters and presses metal powder to form a workpiece to shape. The burrs formed in the workpiece as a result of the pressing operation are subsequently pressed into the workpiece by a separate pressing operation.

3,563,083

AUTOMATIC INTERFACE FOR GAS CHROMATOGRAPH-MASS SPECTROMETER SYSTEM

Hanspeter Benz, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif., a corporation of California

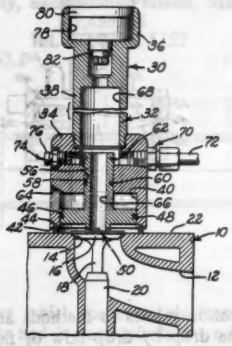
Filed Jan. 15, 1968, Ser. No. 698,019
Int. Cl. G01n *31/08*
U.S. Cl. 73—23.1 **6 Claims**



An analytical system is described including a combination of a gas chromatograph and a mass spectrometer along with an automatic interface apparatus for rendering the two dissimilar components highly compatible in a continuous flow quantitative-qualitative analyzing system. The interface includes an automatic control circuit for detecting the output of the gas chromatograph

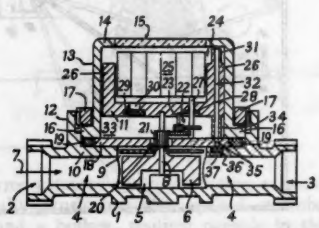
and selecting from each GC peak a predetermined quantity of sample for presentation to the ion source of the mass spectrometer.

3,563,084
VACUUM VALVE TESTING DEVICE
Gene P. Shaffer, 5139 Hazeltine Ave., Sherman Oaks, Calif. 91403
Filed Mar. 3, 1969, Ser. No. 803,883
Int. Cl. G01m 3/28
U.S. Cl. 73—47 2 Claims



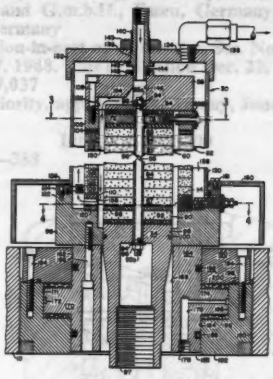
A device for vacuum testing the seal between the head of an intake or exhaust valve of an internal combustion engine, and its seat. The device applies a vacuum to one side of the head of the valve to test the seal between the head and the seat, the magnitude of the vacuum attainable being measured to provide an indication of the quality of the seal. This same vacuum is used to seat the head of the valve and to hold the device in engagement with an appropriate part of the engine. Thus, it is not necessary to completely install the valve, as in the case of a device requiring the presence of the valve spring to hold the head of the valve on its seat. Also, it is not necessary to provide any separate means for holding the testing device in place.

3,563,085
LIQUID METER COUNTER
Eric H. W. Allen, Stopsley, Luton, England, assignor to George Kent Limited, Luton, England a British company
Filed July 18, 1968, Ser. No. 745,875
Claims priority, application Great Britain, July 28, 1967, 34,747/67
Int. Cl. G01f 1/00
U.S. Cl. 73—273 14 Claims



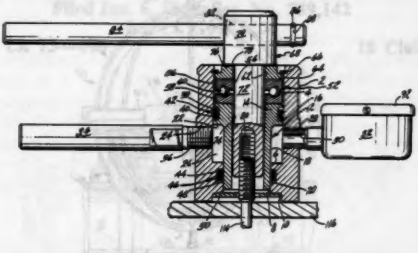
A liquid meter counter provided with means for completely filling a housing containing the counter element with liquid taken from the liquid being metered.

3,563,086
FATIGUE TESTING MACHINE
Flood Everett Reed, Jr., Littleton, Mass., assignor to Littleton Research and Engineering Corporation, Littleton, Mass., a corporation of Massachusetts
Filed Oct. 15, 1968, Ser. No. 767,801
Int. Cl. G01n 3/32
U.S. Cl. 73—92 10 Claims



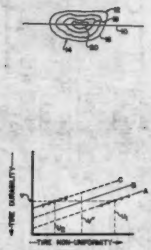
The fatigue testing machine of this invention comprises opposed, re-entrant stacks of piezoelectric elements, a portion of the stack being formed from rings or annuli of piezoelectric material, and each stack having an inner core portion formed of piezoelectric discs or plates. The specimen being tested is held by the free ends of the inner cores. The stacks are driven in opposite directions simultaneously, that is, 180° out of phase, to get the desired pulling and compression on the test specimen. One of the stacks is mounted on a platform which is supported on a viscously damped piston to compensate the apparatus against the effects of static loading on the specimen.

3,563,087
HYDRAULIC TESTER FOR FASTENERS
Lawrence J. Brunnelle, East Haven, and Robert W. Henning, North Haven, Conn., assignors to Olin Corporation, a corporation of Virginia
Filed June 19, 1968, Ser. No. 738,355
Int. Cl. G01n 3/08
U.S. Cl. 73—95 8 Claims



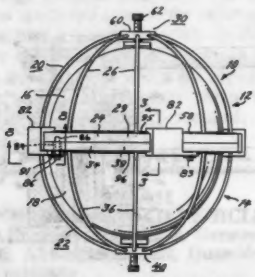
An apparatus for testing the holding power of a fastener wherein a cavity formed between a piston and the internal surface of a housing is provided with a noncompressible fluid. Pull means, mounted in the piston, is provided at one end with means for attaching it to a fastener. Structure is also provided for transmitting the rotational movement of the pull means into an axial force acting on the piston.

3,563,088
NON-DESTRUCTIVE METHOD OF DETERMINING TIRE LIFE
Lawrence R. Sperberg, 6740 Fiesta Drive, El Paso, Tex. 79912
Continuation of application Ser. No. 578,707, Sept. 12, 1966. This application July 14, 1969, Ser. No. 847,778
Int. Cl. G01m 17/02
U.S. Cl. 73—146 14 Claims



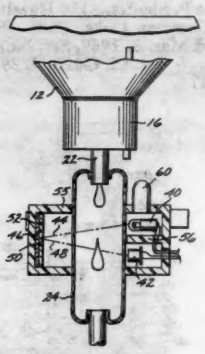
A non-destructive method of determining the durable life of a tire by measuring the lateral and radial force variations exhibited by the tire. A series of similar tires are measured for their force variations, and subjected to usage in order to determine the effect of the force variations upon the durable life characteristics of the series. The force variations exhibited by the tire are compared to the data obtained from the series of tires in order to non-destructively determine the life of the tire.

3,563,089
OCEANOGRAPHIC INSTRUMENT HOUSING
Kenneth W. Henderson, East Falmouth, Mass., assignor to Aquadyne, Inc., East Falmouth, Mass., a corporation of Delaware
Filed Dec. 20, 1967, Ser. No. 692,188
Int. Cl. G12b 9/00
U.S. Cl. 73—170 10 Claims



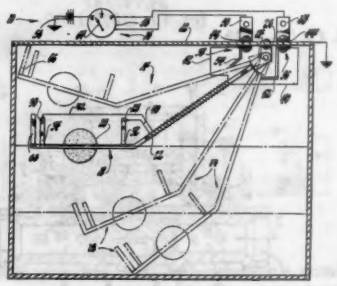
A housing for oceanographic use including two glass hemisphere assemblies and a mating protective cage, the cages having access holes through which electrical conductors and pressure tubes, or the like, may be placed, and the cages being secured to each other by clamps so as to provide convenient access to the interior of the housing.

3,563,090
DROP MONITOR
Basil V. Deltour, 12352 Zig Zag Way, Tustin, Calif. 92680
Filed Sept. 18, 1968, Ser. No. 760,550
Int. Cl. G01f 3/00
U.S. Cl. 73—194 11 Claims



This application relates to methods and apparatus for monitoring the drop by drop flow of fluid and it is described, in the specification, particularly in relation to the monitoring of flow in an intravenous feeding or injection set. Fluid flow is reduced to a succession of drops through a distance along a free-fall path. As successive drops fall past a sensing point in that path, a signal is initiated and is made to endure for a period longer than the period required for the drop to pass the sensing point. An electro-optical sensing and indicating system is shown in which the presence of a drop at the sensing point modifies the quantity of light reaching a light sensitive sensor from a source. Sensitivity and response of the system is enhanced by employing controlled regeneration or positive feedback.

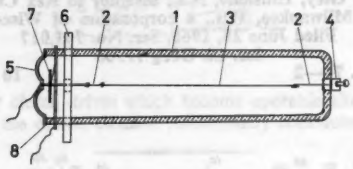
3,563,091
FLOAT-OPERATED THERMISTOR TANK LEVEL SENDER
John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed Aug. 4, 1969, Ser. No. 847,180
Int. Cl. G01f 23/10
U.S. Cl. 73—295 14 Claims



A liquid level indicator having a float positioned in a liquid reservoir, a pair of thermistors secured to the float by a pair of heat transfer members positioned on the float so as to be movable therewith and variably immersed

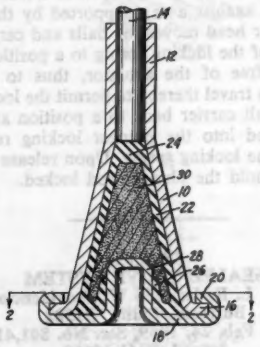
in the liquid for supporting the thermistors and for conveying heat from the thermistors to the liquid so as to vary the temperatures and the resistances of the thermistors, and an indicating device responsive to the respective thermistor resistances so as to provide an indication of the quantity of liquid in the reservoir.

3,563,092
THERMOMETER
Vilho Vaisala, Mantytie 5A, Helsinki, Finland
Filed May 19, 1969, Ser. No. 825,672
Claims priority, application Finland, May 24, 1968, 1,455/68
Int. Cl. G01k *5/52*
U.S. Cl. 73—363.1 **2 Claims**



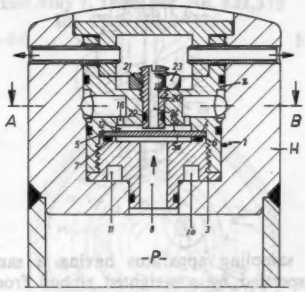
A thermometer which measures electrocapacitively or electroinductively and is particularly intended for use in radiosondes is particularly characterized by a body member which is U-shaped and which consists of transparent profiled glass material, preferably quartz glass. A measuring metal wire extends within the body member and has an end connected by an extension wire to an adjustment device carried by the central portion of the U-shaped body member. The other end of the measuring wire is connected by another extension wire to a spring carried by the ends of the two legs of the U-shaped body member.

3,563,093
THERMO-ACTUATOR DEVICE
James F. Scherer, 2 Waljo Trail, Milford, Ohio 45150
Filed May 16, 1969, Ser. No. 825,239
Int. Cl. G01k *5/34*
U.S. Cl. 73—368.3 **8 Claims**



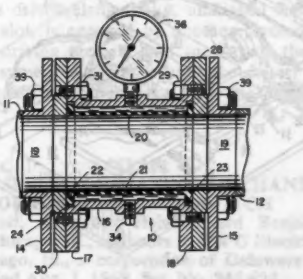
A thermo-actuator device including a housing having a generally frusto-conically shaped chamber formed therein and a hollow, resilient capsule in the chamber having an external shape corresponding to the interior shape of the chamber and being filled with a temperature-responsive material that expands and contracts to an abnormal degree with changes in temperature within a predetermined narrow temperature range. The side walls of the capsule are substantially straight and of uniform thickness from the base to the apex of the capsule so as to produce uniform flexing thereof along the entire length of the capsule when the material therein expands or contracts.

3,563,094
CONTROL SYSTEMS FOR MINING EQUIPMENT
Hans Rieschel, Miltenberg, Germany, assignor to Bergwerksverband G.m.b.H., Essen, Germany, a corporation of Germany
Continuation-in-part of application Ser. No. 716,593, Mar. 27, 1968. This application Dec. 22, 1969, Ser. No. 887,037
Claims priority, application Germany, June 1, 1967, B 92,813
Int. Cl. G01l *7/00*
U.S. Cl. 73—388 **1 Claim**



The specification describes a hydraulic-pneumatic analog transducer for providing a pneumatic pressure indication of the hydraulic pressure existing in a hydraulic ram. The transducer makes use of a membrane of which one side is subjected to the hydraulic pressure while the other side, in accordance with the hydraulic pressure obtaining, varies in its distance from the end of a tube. Air is caused to pass between the resulting annular gap between the end of the tube and the membrane and the resulting pressure gradient is measured by means of a pneumatic pressure gauge.

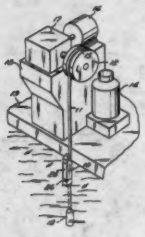
3,563,095
FLUID PRESSURE SENSOR
Lonnie O. Robinson, Jr., Kalamazoo, Mich., assignor to Dover Corporation, Cincinnati, Ohio, a corporation of Delaware
Filed Jan. 6, 1969, Ser. No. 789,142
Int. Cl. G01l *7/00*
U.S. Cl. 73—406 **10 Claims**



A device for sensing the pressure in a fluid line passage includes a tubular sleeve, which is formed of a flexible and resilient material, having its inner diameter the same

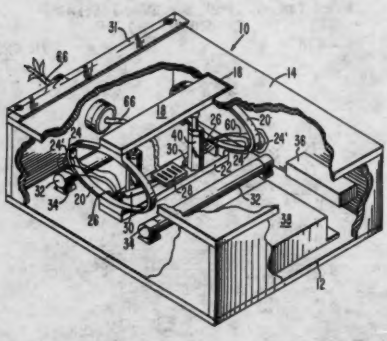
as the diameter of the fluid line passage. The sleeve has flanges on each end disposed within recesses in each end of a mounting body for the sleeve. Each recess is formed so that its entrance opening for the flange of the sleeve is smaller than any other portion of the recess whereby the flange is retained within the recess.

3,563,096
LIQUID SAMPLING APPARATUS
Leonard H. Kinkelaar, 4007 Walter Ave., Parma, Ohio 44134
Filed May 12, 1969, Ser. No. 823,725
Int. Cl. G01n 1/12
U.S. Cl. 73—425.4 **11 Claims**



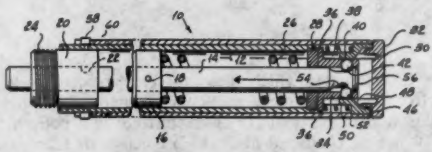
Liquid sampling apparatus having a sampling container suspended by a weighted ribbon from a motor-driven drum. The drum lowers the container to a sampling position, in which the container is upright and presents an inlet opening spaced appreciably above its bottom wall, and then raises the container to a discharge position, in which the container is inverted to spill the liquid sample out of a discharge opening at its upper end.

3,563,097
CONVERSION OF HANDWRITING INTO ELECTRICAL SIGNALS
Edwin O. Roggenstein, Birmingham, and Nallicheri T. Viswanathan, Plymouth, Mich., assignors to Burroughs Corporation, a corporation of Michigan
Filed Nov. 6, 1968, Ser. No. 773,896
Int. Cl. G01l 5/00
U.S. Cl. 73—432 **20 Claims**



Apparatus for converting the act of handwriting to electrical signals and particularly to apparatus having a tablelike provision for yielding to the pressures exerted by a writing implement, such as during the writing of a signature, for transducing such pressures into electrical waveforms which may be recorded or illustrated for comparison and identification purposes. The apparatus employs a handwriting surface elastically yieldingly supported by a pair of elliptically-shaped members disposed in spaced apart parallel planes and further employs electrical strain gages operatively associated with the supporting members for sensing the strains to which the members are subjected during the handwriting procedure and for generating electrical signals indicative thereof.

3,563,098
AUTOMATIC QUICK RELEASE MECHANISM
Paul R. Gley, Hillsdale, N.J., assignor to Rex Chainbelt Inc., Milwaukee, Wis., a corporation of Wisconsin
Filed June 28, 1968, Ser. No. 741,017
Int. Cl. G05g 17/00
U.S. Cl. 74—2 **10 Claims**

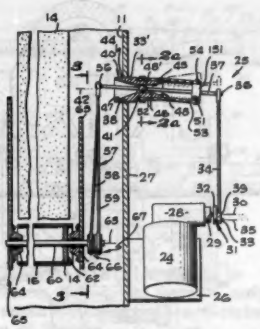


An improved automatic quick release locking mechanism in which a lock-operating spring normally urges a locking ball carrier movably supported on a barrel to such a position relative to a ball actuator secured to an outer sleeve, as to move locking balls to positions at which they may occupy a recess in a plunger rod slidably supported on the barrel to lock the rod against movement under the influence of a drive spring. To release the mechanism, the plunger-actuated element is held against a surface and the sleeve is moved toward the surface to move the actuator away from the balls to free them for movement under the influence of the plunger head to free the plunger rod. To cock the mechanism, the end of the plunger rod is held against a resistant surface and pressure is exerted against a cap supported by the barrel so that the plunger head moves the balls and carrier against the operation of the locking spring to a position at which the balls are free of the actuator, thus to permit the plunger head to travel thereby to permit the locking spring to move the ball carrier back to a position at which the balls are moved into the plunger locking recess under the action of the locking spring. Upon release of the cap, the balls will hold the plunger rod locked.

3,563,099
SEALED DRIVE SYSTEM
Earl L. Rader, 154 W. Providencia, Burbank, Calif. 91502
Filed Feb. 24, 1969, Ser. No. 801,411
Int. Cl. F16j 15/50
U.S. Cl. 74—18.1 **14 Claims**

A drive system by which a rotary motor at one side of a wall structure may drive a rotary element at the opposite side of the wall structure, with the wall being completely sealed and fluid tight at the location of the drive. The drive arrangement includes a lever extending through an opening in the wall structure and mounted for oscillatory pivotal movement, and sealed with respect to the wall, with opposite ends of the lever connected operatively to a motor driven rotary element at one side of

the wall and the second rotary element. The latter may be driven by the oscillatory pivotal lever through two

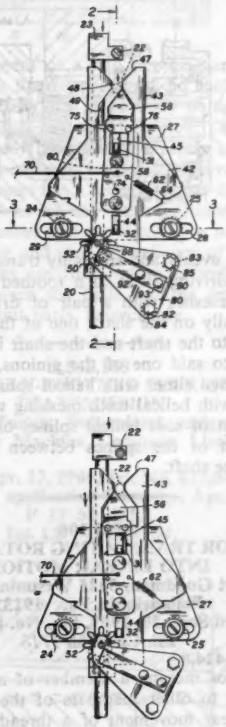


one-way clutch drives which become operable alternately to turn the driven element substantially continuously.

3,563,100
AUTOMATIC SLIDE TRAY ADVANCING MECHANISM

Robert G. Palmer, Wayne, and Israel Nesson, Hackensack, N.J., assignors to Atlas-Rand Corporation, Paramus, N.J., a corporation of New Jersey

Filed July 30, 1969, Ser. No. 846,138
Int. Cl. F16h *19/04*
U.S. Cl. 74—30 **23 Claims**

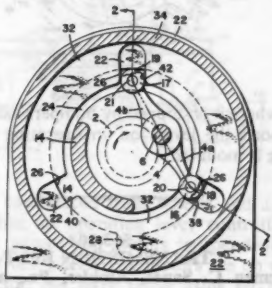


An automatic slide tray advancing mechanism for use particularly in a slide projector is adapted to successively and selectively move either rectangular or round trays either forwardly or backwardly a distance equal to the spacing of one slide. This movement is powered by the engagement of a pin of a slide transfer apparatus with the tray advancing mechanism and is accomplished with a complete reciprocation of the slide transfer apparatus. A rack member of the tray advancing mechanism is moved in a cycle pattern by the pin of the transfer apparatus and during a portion of this cycle engages a pinion to rotate the pinion one tooth. Ball detent means is provided to maintain the pinion in a slide tray alignment condition except as the pinion is being rotated.

3,563,101
INTERMITTENT DRIVE DEVICE

Roger Kinnicutt, Jr., Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass., a corporation of Massachusetts

Filed May 7, 1969, Ser. No. 822,375
Int. Cl. F16h *27/06*
U.S. Cl. 74—84 **14 Claims**



Means whereby a driving element imparts intermittent motion to a driven element. The motion of the driving element may be rotary, linear or otherwise according to a predetermined path. It may be continuous or reciprocating. The extent and timing of the intermittent motion is determined by the number and spacing of slots in the driven element and in a fixed control element. When a control element slot becomes aligned with a slot in the driven element, a driving arm pivoted on the driving element and normally in compression as it pushes the driven element loses its driving characteristic and enters the aligned slots to act as locking means to prevent temporarily motion of the driven element while the driving element continues its movement. Simultaneously, upon withdrawal of the driving arm from the aligned slots, the edge of a driven element slot, unaligned with a control element slot, is engaged by another pivoted driving arm on the driving element and motion of the driven element is resumed to continue until the driven element slot comes again into alignment with the next control element slot.

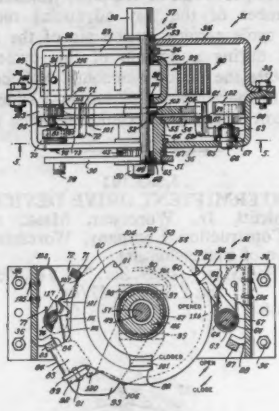
3,563,102
SPIRAL SPRING OPERATING MECHANISM FOR HIGH VOLTAGE SWITCH

Joseph Bernatt, Arlington Heights, and Benjamin L. Gelfand, Chicago, Ill., assignors to S & C Electric Company, Chicago, Ill., a corporation of Delaware

Filed Aug. 1, 1969, Ser. No. 846,694
Int. Cl. F16h *21/54*; H01h *3/00*
U.S. Cl. 74—100 **14 Claims**

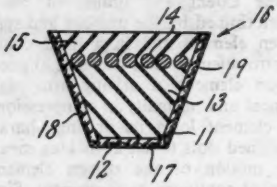
A spiral spring interconnects a manually operated drive lever and a toggle lever connected to a switch. The toggle lever is held in switch-closed or switch-open position by

spring-biased trip latches which permit the spring to be stressed by the drive lever until cams thereon release the latches. The spring pivots the toggle lever to the alternate



position where it is stopped by bumpers carried by a frame that supports the levers on an operating shaft on which the spring is mounted.

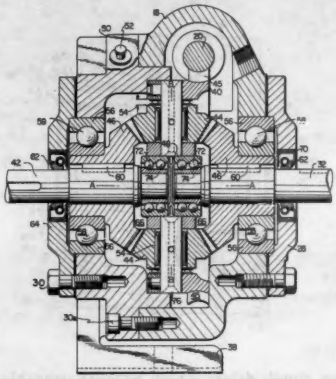
3,563,103
TRANSMISSION BELT
Herman C. Sauer, Ambler, Pa., assignor to Uniroyal, Inc., a corporation of New Jersey
Original application May 20, 1966, Ser. No. 551,735. Divided and this application Apr. 18, 1969, Ser. No. 836,187
Int. Cl. F16g 5/08
U.S. Cl. 74—233 **2 Claims**



A new V-belt construction is disclosed wherein a layer of special rubber having different physical characteristics from the rubber forming the body of the V-belt is positioned between the body and a wear resistant fabric. The specialty rubber extends into the interstices of the fabric.

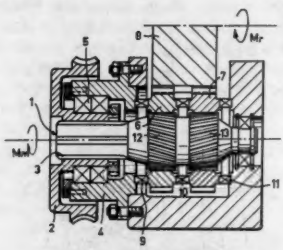
3,563,104
PHASE CONTROLLER
John David Schuster, Sylvania, Ohio, assignor to Dynamics Research & Development Corporation, Toledo, Ohio, a corporation of Ohio
Filed Dec. 20, 1968, Ser. No. 785,564
Int. Cl. F16h 35/06
U.S. Cl. 74—395 **5 Claims**

The phase of the output shaft of a mechanical power transmission relative to its input shaft is selectively controlled through a first gear mechanism which is rotatably mounted about the axes of the shafts and a second gear



mechanism fixedly supported with respect to the axes of the shafts and intermeshing with the first gear mechanism.

3,563,105
TOOTHED MESHING TRANSMISSION MECHANISMS
Roberto Graziosi, Brescia, Italy, assignor to Istituto per le Ricerche di Tecnologia Meccanica, Turin, Italy
Claims priority, application Italy, Oct. 12, 1968, 53,476/68
U.S. Cl. 74—410 **13 Claims**



In order to evenly and smoothly transmit a rotary motion from a driving shaft to a toothed driven member, the member meshes with a pair of driving pinions arranged coaxially on the shaft; one of the pinions is helically splined to the shaft and the shaft is axially floating with respect to said one of the pinions, while the other pinion is formed either with helical splines coupling it to the shaft or with helical teeth meshing with the member, the inclination of said helical splines or teeth being opposite to that of the splines between said one of the pinions and the shaft.

3,563,106
DEVICE FOR TRANSLATING ROTARY MOTION INTO LINEAR MOTION
Robert Goodman, 5325 Westminster Ave., Philadelphia, Pa. 19131
Filed Sept. 29, 1969, Ser. No. 861,753
Int. Cl. F16h 1/18
U.S. Cl. 74—424.8 **5 Claims**

A device for moving a member of a combination of parts relative to other members of the combination by means of linear movement of a threaded rod. The rod is threadedly engaged with a nut, the nut being positioned within a tubular rod. The nut is normally held by brake shoes against rotation relative to the tubular rod so that the threaded rod is movable through the nut. However, when a lug at either end of the rod engages a correspond-

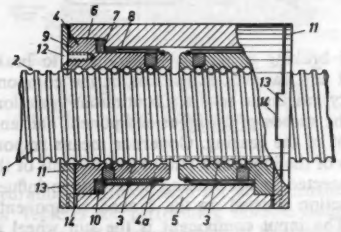
ing lug on the nut, continued rotation of the rod exerts a rotational force on the nut sufficient to cause the nut

to rotate relative to the tube. This acts to halt longitudinal movement of the threaded rod relative to the tubular rod.

3,563,107
NUT MECHANISM

Sven Walter Nilsson, Savedalen, Sweden, assignor to Aktiebolaget Svenska Kullagerfabriken, Goteborg, Sweden, a corporation of Sweden

Filed June 25, 1969, Ser. No. 836,483
Claims priority, application Sweden, June 28, 1968, 8,839/68
Int. Cl. F16h *1/18, 55/04, 55/18*
U.S. Cl. 74—441 **9 Claims**

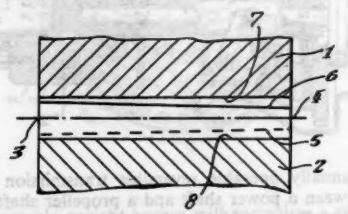


The nut component of a ball nut mechanism is composed of two parts fitted together by an enclosing sleeve. Each nut part consists of a main body portion, in which the ball recirculation passage is located, and a radially directed end flange. This fits into a recess at the end of the sleeve; and the main portion of the sleeve defined between the two recesses has a larger internal diameter than the external diameter of the main portions of the nut parts in such a manner that the latter have no radial contact with the sleeve and thus are relieved of stresses and shock loads. Means are furthermore provided to adjust the clearance between the balls and the grooves in the sleeve and in the nut parts, respectively.

3,563,108
HELICALLY-TOOTHED SPUR GEAR TRANSMISSION

Robert Wydler, Zurich, Switzerland, assignor to Maag Gear Wheel & Machine Company Limited, Zurich, Switzerland

Filed Apr. 17, 1969, Ser. No. 817,044
Claims priority, application Germany, Apr. 20, 1968, P 17 50 421.1
Int. Cl. F16h *55/04*
U.S. Cl. 74—458 **2 Claims**

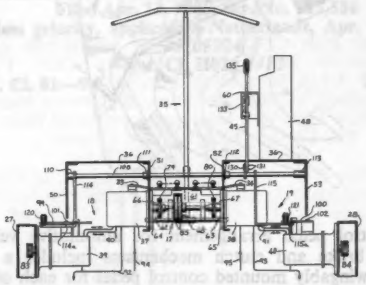


In a helically-toothed cylindrical gear transmission having a tooth height which is variable along the tooth width, the tooth height of at least one of the gearwheels is smaller at the trailing end of the tooth width than at the leading end.

3,563,109
TWO RANGE STEERING AND SPEED CONTROL MECHANISM FOR A DUAL HYDRAULIC TRANSMISSION SEPARATELY DRIVING TWO WHEELS OF A TRACTOR

Emmett F. Glass, Akron, Edmund O. Howell, New Holland, and Bruce D. Schwalm, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa., a corporation of Delaware

Filed Apr. 14, 1969, Ser. No. 815,712
Int. Cl. G05g *9/00*
U.S. Cl. 74—470 **8 Claims**

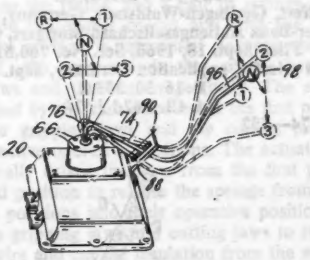


A tractor has two spaced front wheels and a trailing tail wheel and has an operating lever controlling two sets of hydraulic pumps and motors independently driving a respective front wheel. The motors are on opposite sides of the tractor and have pintle arms set by lever means under resilient pressure against stops in one of two speed ranges.

3,563,110
TRANSMISSION SHIFT

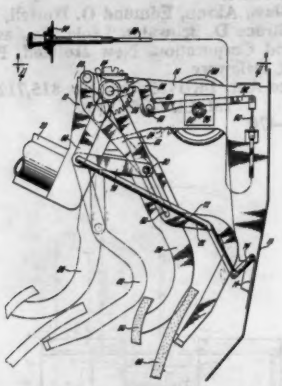
Hans Hauser, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio, a corporation of Ohio

Filed June 30, 1969, Ser. No. 837,415
Int. Cl. G05g *9/00*
U.S. Cl. 74—473 **8 Claims**



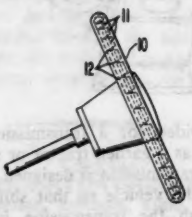
A shift is provided for a transmission used with a small vehicle such as a garden tractor or a riding mower. The shift for the transmission is designed to be accessible from the side of the vehicle so that shifting can be effected even though the transmission is positioned or mounted so that it cannot be shifted through the usual upright shift lever. The shift lever is formed in an "N" configuration with a central portion extending through a guide bracket mounted on the transmission to limit the movement of an intermediate portion of the shift lever and to form a second pivot for the lever when in neutral.

3,563,111
ADJUSTABLE CONTROL PEDALS
Philip B. Zeigler, Pittsford, N.Y., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed July 24, 1968, Ser. No. 747,173
Int. Cl. G05g 1/04
U.S. Cl. 74—512 4 Claims



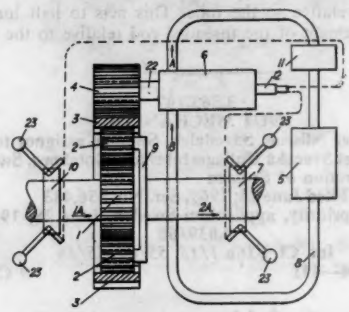
A control pedal arrangement for automotive vehicle throttle, brake and clutch mechanisms includes a suspended swingably mounted control pedal for each of the control mechanisms and connected with a shiftable control rod from the respective control mechanism through means of an adjusting link having pivotal connection with the control rod and having pin and slot connection with such pedal member in a manner permitting positional adjustment of such pedal member on the mechanism control rod and relative to the passenger seat to suit the needs of an individual vehicle operator. The pedal member is selectively adjusted by an operating link connected to the adjusting link and driven by a crank which is spring-biased in one direction of adjustment and responsive to foot pressure on the pedal members for adjustment in the other direction, with latching means provided to hold the pedals in a selected position.

3,563,112
SAFETY STEERING WHEEL FOR MOTOR VEHICLES
Karl Wilfert, Gerlingen-Waldstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany
Filed Sept. 18, 1968, Ser. No. 760,512
Claims priority, application Germany, Sept. 19, 1967, P 16 30 355.2
Int. Cl. B62d 1/04
U.S. Cl. 74—552 10 Claims



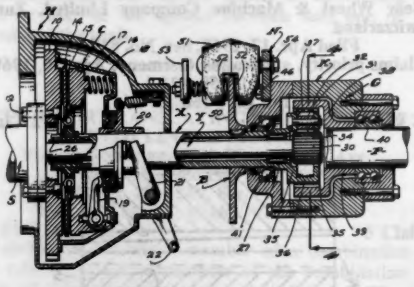
A safety steering wheel for motor vehicles, especially passenger motor vehicles in which the steering wheel rim and/or the steering wheel spokes have a smaller form-rigidity in the direction of the steering column than in the direction of the normal steering forces.

3,563,113
AUTOMATIC PLANETARY GEARBOX PRODUCING INFINITELY VARIABLE SPEED RATIOS
Graeme Gordon Harvey, 3 Benatar Way, Alexandra Park, Salisbury, Rhodesia
Filed May 13, 1968, Ser. No. 728,395
Claims priority, application Rhodesia, May 11, 1967, 194/67
Int. Cl. F04b 23/10, 41/00; F16h 57/10
U.S. Cl. 74—786 3 Claims



A fluid braking apparatus is arranged to brake to a controlled and variable extent one of the components of a planetary gearing to secure a continuous variation of the ratio of the speeds of an input component and an output component of the gearing. Governor means responsive to the speeds of the input and output components of the gearing is connected to the braking apparatus to influence the braking action exerted on the braked component of the gearing. The input component is the sun wheel and the output component is a planet carrier upon which is mounted planet wheels. The braked component is an annulus driven by the gearing. A pump is driven by the annulus, and a valve on the rotor shaft of the pump is controlled by the governor means controllably restricting the flow of fluid from the pump to brake the pump and annulus.

3,563,114
FORWARD AND REVERSE PLANETARY GEARING
Ernest R. Casale, Huntington Beach, Calif. (% Casale Engineering, 161 8th Ave., City of Industry, Calif. 92705)
Filed July 22, 1969, Ser. No. 843,507
Int. Cl. F16h 3/44
U.S. Cl. 74—792 15 Claims



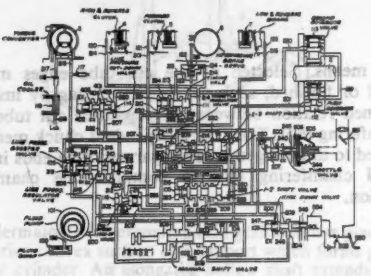
A manually operable reversible transmission engageable between a power shaft and a propeller shaft including a manually operable clutch, a manually operable shaft braking means, and a planetary gear train, said clutch, brake means and gear train being related to the power and

propeller shafts and with each other whereby disengagement of the clutch and braking means disengages drive between the shafts, engagement of the clutch establishes direct drive between the shafts and actuation of the braking means establishes gear reduced reverse drive between the shafts.

3,563,115
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Tetsuya Iijima, Tokyo, and Katsuo Yamada, Yokohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama, Japan

Filed Dec. 11, 1968, Ser. No. 782,989
Claims priority, application Japan, Dec. 22, 1967, 42/81,843, 42/81,844
Int. Cl. B60k *21/10*; F16h *57/10*
U.S. Cl. 74—869 **4 Claims**

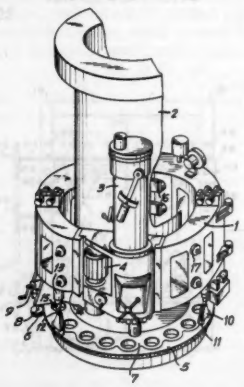


A hydraulic control system for an automatic transmission for vehicles for performing suitable timing relation of engagement and disengagement of the friction elements while shifting. A valve means is provided to regulate engagement and disengagement timing of an intermediate friction brake at low throttle pressure conditions.

3,563,116
PORTABLE UPRIGHT BORING MILL

Grigory Yakovlevich Gurvich, Ulitsa Zamshina 21, kv. 68; Leonid Sergeevich Krajukhin, Dalnevostochny prospekt 19, kv. 34; and Rady Nikolaevich Verbitsky, Nevsky prospekt 20, kv. 2, all of Leningrad, U.S.S.R.

Filed July 31, 1968, Ser. No. 749,160
Int. Cl. B23b *39/14*
U.S. Cl. 77—2 **4 Claims**

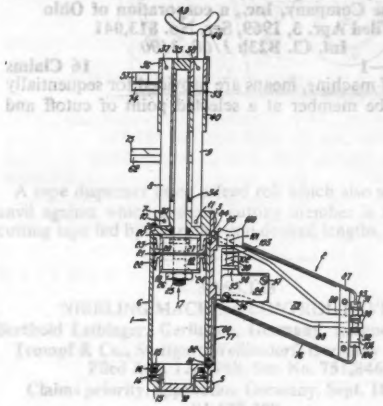


A portable upright boring mill comprises a split hollow cylinder body which can be attached to the shaft of a workpiece whose flange is to be machined by boring holes therein. The mill is mounted on the workpiece by fitting the body on the shaft so that it surrounds the same and the body comprises a spindle head for machining the holes in the flange. The body can be moved along the workpiece flange by means of a turning mechanism which includes a drive installed on the mill body and engaged with a gear in turn engaged with a toothed rim secured on the workpiece flange. The body rests on supports which are articulated to carriages which roll on the flange for travel of the mill thereon.

3,563,117
DEVICE FOR STRIPPING INSULATION FROM INSULATED WIRES

Frans Pharailda Jozef Boissens, Heide-Kalmthout, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 23, 1968, Ser. No. 723,386
Claims priority, application Netherlands, Apr. 27, 1967, 6705924
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.5 **20 Claims**



An apparatus for stripping insulation from wire includes a pistol shaped frame with a pneumatic trigger, a cam mounted on the frame and being longitudinally movable between a first position and a second position, a pair of gripping and insulation cutting jaws respectively mounted on the frame, and a pair of springs, which are actuated by the trigger to cut and strip the insulation. One of the springs is interposed between the gripping jaws and the cam, and the other between the cutting jaws and the cam respectively. The springs are pretensioned by the cam disposed in the first position for urging the gripping jaws and the cutting jaws toward their respective operative positions. The actuating trigger pneumatically drives the cam from the first position to the second position to release the springs from their pretensioned positions into their operative positions for enabling the gripping jaws and cutting jaws to respectively grip the wire and cut the insulation from the wire.

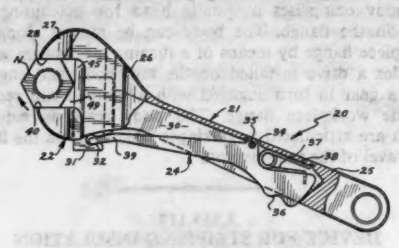
3,563,118
ADJUSTABLE SELF-LOCKING WRENCH

Edmund W. F. Rydell, % The Rydell Co., 2328 N. 2nd St., Minneapolis, Minn. 55411

Filed Apr. 24, 1968, Ser. No. 723,795
Int. Cl. B25b *13/12*
U.S. Cl. 81—129 **7 Claims**

A wrench having a fixed jaw on a handle and a movable jaw operated by a control lever pivoted on the handle, the movable jaw having a dovetail portion mounted in a

dovetail slide in the handle and adapted to wedge and lock therein when turning pressure is applied by the



wrench upon a workpiece. Spring means act upon the control lever to bias the movable jaw toward the fixed jaw.

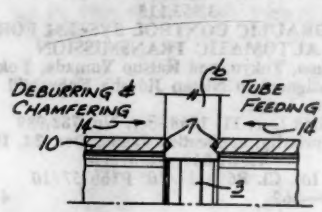
3,563,119

METHOD FOR CUTTING TUBE MEMBERS AND FINISHING SELECTED OF THE CUT TUBE EDGES AT A SINGLE STATION

Alex Shashaty, Youngstown, Ohio, assignor to Fairfield Machine Company, Inc., a corporation of Ohio

Filed Apr. 3, 1969, Ser. No. 813,041
Int. Cl. B23b *1/00, 3/00*
U.S. Cl. 82—1 **16 Claims**

In a cutoff machine, means are provided for sequentially cutting a tube member at a selected point of cutoff and chamfering selected of the tube edges, as cut, at a single station. The tube is positioned for cutoff within the cutoff machine and thereafter is gripped by independent chuck means adjacent both sides of the selected point of cutoff. Upon completion of the cutoff operation at the selected cutoff point, the cut tube ends are separated while the same are still being firmly gripped by independent

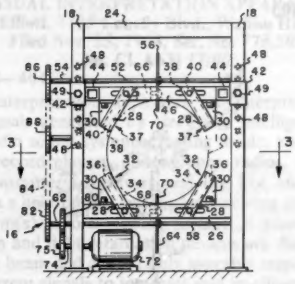


chuck means. Selected of the cut tube edges may be dressed or finished, such as, by chamfering by inserting, in aligned relation between the separated cut tube ends, a chamfering tool. Then the independent chuck means are operated to draw together the separated tube ends into the aligned chamfering tool to complete the chamfering operation.

3,563,120
DERMATOME
Ladislav Barinka and Frantisek Libra, Brno, Czechoslovakia, assignors to Chepos Zavody chemickeho a Potravinarskeho Strojirenstoi Brno, oborovy podnik, Brno, Czechoslovakia
Filed July 8, 1969, Ser. No. 839,880
Int. Cl. B26d 4/42; A61b 17/32
U.S. Cl. 83—4 8 Claims

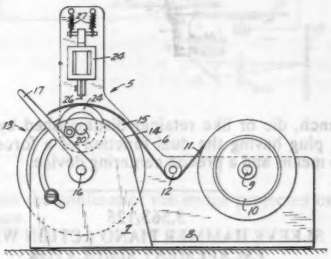
In a dermatome for preparing skin grafts, skin is placed on the exterior convex surface of a support which forms part of a hollow cylinder. An elongated hollow shaft extends along the axis of the cylinder and is fixed to end walls of the support while an operating shaft extends through and beyond the hollow shaft. The operating shaft terminates in eccentric portions which have a common axis parallel and spaced from the axis of the operating shaft. A pair of arms is carried by these eccentric portions and they are capable of being adjustably fixed thereto. These arms carry distant from the operating shaft a reciprocating blade which can reciprocate parallel to the operating shaft while swinging with the arms and the operating shaft about the axis of the curved wall on which the skin is supported. The hollow shaft is itself supported on a pair of forks in upwardly directed notches thereof.

3,563,121
CUTTING APPARATUS
Furman S. Cox, Seneca, and Warren P. Burgess, Salem, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C., a corporation of South Carolina
Filed Dec. 9, 1968, Ser. No. 782,274
Int. Cl. B23d 45/12
U.S. Cl. 83—105 3 Claims



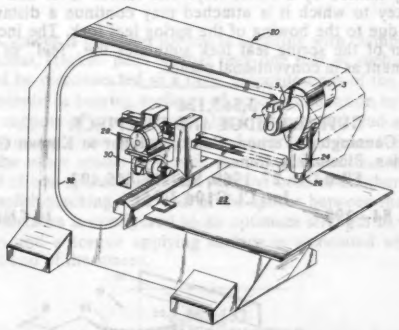
A cutting apparatus which employs two circular saws to cut a paper tube into two substantially identical semicircular halves. The saws are mounted on an adjustable frame having a plurality of members to guide the tube through the apparatus. Elongated plate members are provided on the frame in line with each of the saws to separate the halves after being cut.

3,563,122
TAPE DISPENSING APPARATUS
Richard P. De Neui, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware
Filed May 22, 1969, Ser. No. 826,947
Int. Cl. B26d 5/26
U.S. Cl. 83—205 4 Claims



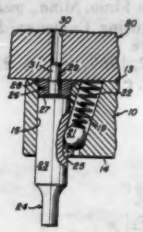
A tape dispenser using a feed roll which also serves as the anvil against which a sharp cutting member is directed for cutting tape fed by the roller into desired lengths.

3,563,123
NIBBLING MACHINE CONTROL DEVICE
Berthold Leibinger, Gerlingen, Germany, assignor to Firma Trumpf & Co., Stuttgart-Weilimdorf, Germany
Filed Aug. 12, 1968, Ser. No. 751,846
Claims priority, application Germany, Sept. 16, 1967, P1,627,299
Int. Cl. B23d 27/00; B26d 5/20
U.S. Cl. 83—237 4 Claims



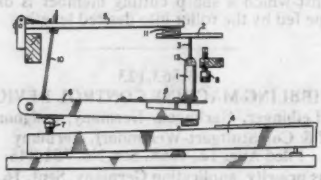
A control device for a nibbling machine is formed of an eccentric shaft, means mounted on and rotatable with the shaft for opening and closing a switch, and a switch member spaced radially outward from the shaft. Either the means for opening and closing the switch or the components of the switch may be variably spaced apart for achieving adjustable control of the device.

3,563,124
PUNCH AND DIE RETAINERS
Robert J. Gargrave, Dayton, Ohio, assignor to Dayton Progress Corp., Dayton, Ohio, a corporation of Ohio
Filed Dec. 16, 1968, Ser. No. 783,960
Int. Cl. B26f *1/14*
U.S. Cl. 83—698 23 Claims



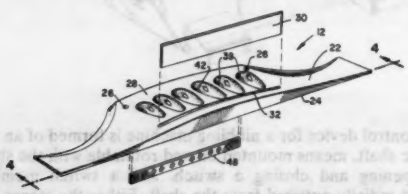
A punch, die or like retainer distinguished by a uniquely formed plug having the dual function of a force dissipating backup means and a precise centering device.

3,563,125
SLEEVE HAMMER PIANO ACTION WITH ESCAPEMENT SIMULATOR
Robert A. Brocato, 108 E. Jordan St., Shreveport, La.
Filed Jan. 21, 1969, Ser. No. 792,522
Int. Cl. G10c *3/18*; G10d *13/08*
U.S. Cl. 84—237 3 Claims



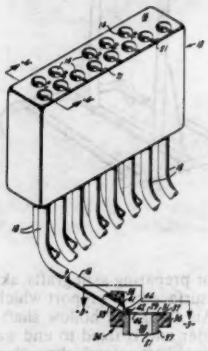
An escapement-simulating device used in a piano action having as a striking hammer, a sleeve hammer impelled upward along a shaft by a forked lever. The escapement simulator is a spring leaf fork attached to the top side of the forked impelling lever. The upward motion of the spring leaf fork is abruptly limited by a travel stop. The forked lever and the piano key to which it is attached may continue a distance farther due to the bowing of the spring leaf fork. The incorporation of the spring leaf fork simulates the "feel" of an escapement as in conventional pianos.

3,563,126
GUITAR BRIDGE AND TAILPIECE
Russell Connington, Vernon, Conn., assignor to Kaman Corporation, Bloomfield, Conn.
Filed Oct. 27, 1969, Ser. No. 869,493
Int. Cl. G10d *3/04*
U.S. Cl. 84—298 10 Claims



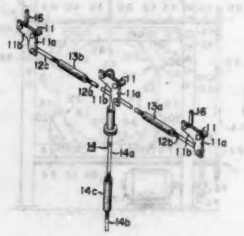
A combined bridge and tailpiece for a guitar or similar stringed musical instrument includes a base member having an elongated bridge strip projecting from the forward surface thereof and arranged generally perpendicular to the strings. Below the bridge strip the base member includes a plurality of holes, for receiving the strings, passing from its forward surface to its lower surface. A reinforcing strip of metal is inset in the rear surface of the base member and arranged so that the string openings pass therethrough.

3,563,127
MUSICAL TONE PRODUCING DEVICE
Tadashi Funakoshi, 5925 Maleville Ave., Carmichael, Calif. 95608
Filed June 16, 1969, Ser. No. 833,616
Int. Cl. G10d *7/00*
U.S. Cl. 84—330 12 Claims



A vessel having an effective tone-producing air column includes an orifice toward which is angularly directed one end of an air-conducting conduit, the other end of the conduit being capable of receiving air under pressure. By providing a plurality of such vessels, each tuned to emit a tone of predetermined frequency, and by connecting the vessels to conduits extending to corresponding openings in a common mouthpiece member, the user can play a tune by blowing into the appropriate mouthpiece openings. Tuning of the vessels is accomplished by adjusting the effective tone-producing air column therein, either by positioning an adjustable plunger member or by filling the vessel with liquid until the desired pitch is attained.

3,563,128
PERCUSSION MUSICAL INSTRUMENT
Shigeo Suzuki, Hamamatsu-shi, Japan, assignor to Nippon Gakki Kabushiki Kaisha, Shizuoka-ken, Japan
Filed June 4, 1969, Ser. No. 830,401
Claims priority, application Japan, June 28, 1968, 43/54588
Int. Cl. G10d *13/08*
U.S. Cl. 84—403 4 Claims



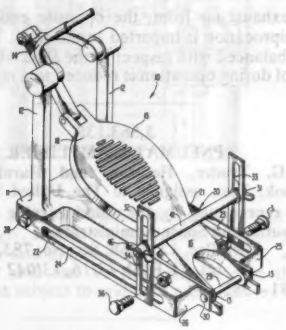
A percussion musical instrument particularly involves three linearly arranged middle, right and left rods each connected to an adjacent rod by a turnbuckle in a manner to allow the space therebetween to be extended, and two bell cranks pivotally connected to said right and left rods respec-

tively and supporting a crossbar for damping the vibrations of tone bars. The horizontal movement of said middle rod causes said crossbar to be moved to and away from said tone bars by the media of said right and left rods and bell cranks. The adjustment of said turnbuckles controls the magnitude of force with which the right and left portions of said crossbar attach themselves to the tone bars.

3,563,129
BASS DRUM PEDAL

Franklin O. Cantrell, 4930 Rosewell Road Apt. 34, Atlanta, Ga. 30305

Filed Dec. 22, 1969, Ser. No. 887,170
Int. Cl. G10d *13/00*
U.S. Cl. 84—422 **5 Claims**



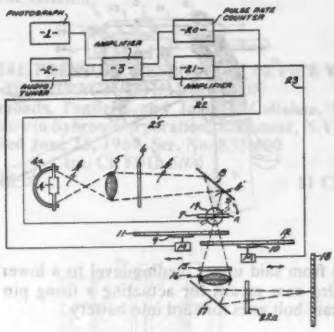
A bass drum pedal assembly which includes a supporting framework, a striking arm assembly pivotally supported by the framework, and a foot pedal having a heel portion pivotally connected to the framework and toe portion connected to the striking arm assembly. Upright support stanchions are positioned on opposite sides of the pedal, and an arch support bar is connected at its ends to the upright support stanchions above the pedal. The arch support bar is moveable vertically along the upright support stanchions, and the stanchions are moveable laterally along the length of the supporting framework, so that the arch support bar can be repositioned as desired to support the arch of the foot of the drummer.

3,563,130
VISUAL INTERPRETATION APPARATUS

Stanley B. Elliott, 7125 Conelly Blvd., Walton Hills, Ohio

Filed Nov. 25, 1968, Ser. No. 778,508
Int. Cl. A63j *17/00*
U.S. Cl. 84—464 **10 Claims**

Visual interpretation apparatus for interpreting electric current signals generated by electronic intelligence devices such as audio sound systems creating music, and the like by means of record players, phonographs, radios, AM and FM tuners, transmitters, receivers and the like and which apparatus has a light optical system for receiving and projecting a light beam(s) onto a viewing surface. A plurality of light polarization and light retardation devices are disposed in the path of the beam and are variably movably responsive to the electric current signals to interpret said intelligence and provide visual light patterns on the viewing surface which correspond to said electric current signals. The polarization and retardation devices may partake of various configurations such as discs, vanes and the like. The variable movement of said devices is in the path of the light beam and is in response to the variation in the electric current signals. A consequent change or "sweep" of color on the viewing surface may also be accompanied by what appears to be movement of the

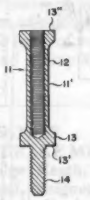


imagery within the confines of the image projected onto the viewing surface.

3,563,131
SPACER

Robert L. Ridley, Sr., Palmetto, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Continuation-in-part of application Ser. No. 712,727, Mar. 13, 1968, now abandoned. This application Apr. 23, 1969, Ser. No. 825,103
Int. Cl. F16b *35/00, 37/00*
U.S. Cl. 85—1 **1 Claim**



A spacer is provided for use in securing wire clamps in individual, stacked pairs so that only one pair of such clamps need be disconnected at a time. Opposite ends of the spacer terminate in bearing surfaces of precise dimension to assure the support of a cantilevered load. A threaded stud extends from one of these spacer ends and a threaded bore is formed in the other spacer end with matching threads so that the stud of one spacer can coact with the bore of another to accomplish stacking. The wall of the spacer between the bearing surfaces is configured to an optimum strength to weight ratio and a torque applying surface is associated with the bore end of the spacer.

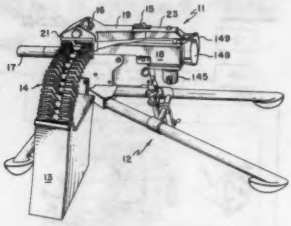
3,563,132
GRENADE LAUNCHER

Walter R. Cashen, Louisville, and George M. Chinn, Harrodsburg, Ky., and William P. Schnatter, Jeffersonville, Ind., assignors, by mesne assignments, to the United States of America as represented by the Secretary of the Navy

Filed Sept. 19, 1968, Ser. No. 760,936
Int. Cl. F41d *9/02, 11/02, 11/16*
U.S. Cl. 89—33 **1 Claim**

An automatic grenade launcher utilizing advanced primer ignition for firing linked grenade rounds and having first cam

means actuated by a reciprocating bolt for indexing rounds at an upper feeding level, second cam means for moving said



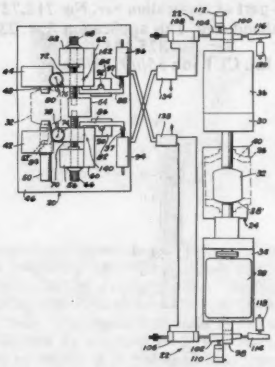
rounds from said upper feeding level to a lower firing level, and third cam means for actuating a firing pin in said bolt while said bolt goes forward into battery.

3,563,133

TOOL COMPENSATOR FOR A PRODUCTION MACHINE

Roger C. Asman, and Graham Lloyd, Detroit, Mich., assignors to Snyder Corporation, Detroit, Mich., a corporation of Michigan

Filed July 29, 1968, Ser. No. 748,497
Int. Cl. B23c *3/00*; B27g *23/00*
U.S. Cl. 90—11 14 Claims



A production machine apparatus which compensates for variations in tools having a remote measuring unit and a control unit. The measuring unit is an adjustable arbor for supporting a cutting tool and a gauge determining the position of a cutting edge of the tool and translating this position into a signal which activates and controls a hydraulic cylinder which positions a movable stop. The stop limits the depth of cut of the tool when it is in a power head which advances the cutting tool into a workpiece.

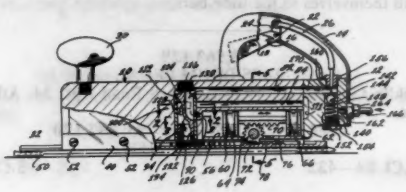
3,563,134

AIR-OPERATED TOOL

Harvey B. Rodstein, 6419 Shenandoah, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 766,259, Oct. 9, 1968, now abandoned. This application Feb. 10, 1969, Ser. No. 801,925
Int. Cl. F01l *31/18*, F01b *9/00*
U.S. Cl. 91—349 7 Claims

The device is an air-operated tool, particularly of the type used for rubbing, sanding or filing, that is, having a reciprocatory motion. The tool embodies a single double-ended piston in a bore, with a rack positioned between the ends of the piston. A reciprocatable shoe carries a second rack and a pinion gear is mounted between the two racks on a transverse axis the piston and shoe reciprocating in opposite directions. A rotary-type valve controls the admission



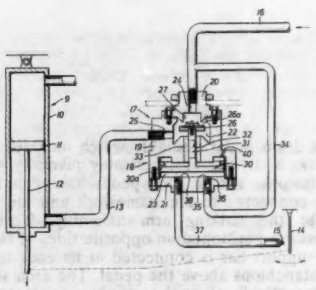
to, and exhaust air from, the opposite ends of the piston while reciprocation is imparted to the shoe. The mass of the piston is balanced with respect to the shoe whereby vibration of the tool during operation is reduced to a minimum.

3,563,135

PNEUMATIC AMPLIFIER

Arthur G. Trader, Houston, and Harold I. Johnson, Seabrook, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 12, 1968, Ser. No. 783,374
Int. Cl. F15b *13/16*, *13/042*
U.S. Cl. 91—385 8 Claims



A pneumatic amplifier is disclosed for controlling a high pneumatic fluid supply pressure and/or flow capacity to a pneumatically powered system. The high supply pressure is controlled by a low pressure at the control side of the pneumatic amplifier. A small pneumatic decrease pulse at the control side of the pneumatic amplifier delivers a larger increased pulse at the output side of the amplifier. By controlling the pressure in the control side of the amplifier, the supply pressure and/or supply flow rate is controlled to the pneumatic system being operated.

3,563,136

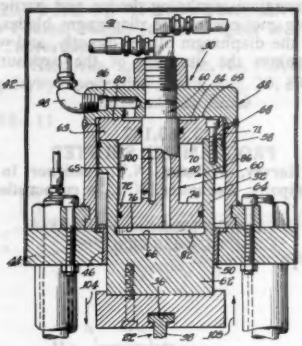
VARIABLE FORCE HYDRAULIC PRESS

Raymond L. Valente, Kankakee, Ill., assignor to Manco Manufacturing Co., Bradley, Ill., a corporation of Illinois

Filed Feb. 14, 1969, Ser. No. 799,309
Int. Cl. F15b *15/08*
U.S. Cl. 91—411 5 Claims

A variable force hydraulic press of the general type which includes a frame having a base portion with a support surface, and a head portion spaced above said base portion. The head portion has a ram arrangement contained therein, whereby the ram may be reciprocated toward and away from the base portion. Said ram arrangement includes a housing and a pistonlike ram element slidably positioned within said

housing. The ram has first and second piston surfaces facing in the same direction and cooperating with said housing to define first and second piston chambers. Conduit means are provided in said housing to achieve a fluid path from each said chamber to the exterior thereof, said fluid paths being



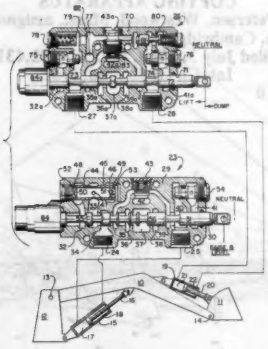
associated with a source of fluid under pressure and control means. Accordingly, a selective application of fluid pressure to either or both said chambers may be attained, with the force exerted by said ram varying according to the total piston surface area subject to said fluid pressure.

3,563,137

HYDRAULIC SELF-LEVELING CONTROL FOR BOOM AND BUCKET

Homer R. Graber, Pretty Prairie, and James W. McFarland, Hutchinson, Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed June 30, 1969, Ser. No. 837,605
Int. Cl. F15b *11/16*
U.S. Cl. 91—414 **21 Claims**



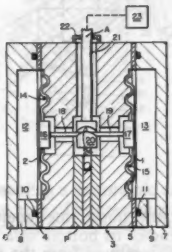
A control system for the selective operation of hydraulic cylinders positioning the boom and bucket of a front end loader. A multiple spool valve is provided with a control spool for the boom and a control spool for the bucket. When the boom is actuated by directing pressure fluid to one end of the boom cylinder, the fluid displaced from the other end of the boom cylinder is selectively directed through a transfer circuit to a flow divider that diverts a predetermined portion of the displaced fluid to actuate the bucket cylinder and maintain the bucket level when the boom is raised and/or lowered. Additional controls may include a pressure relief valve for the transfer circuit, a check valve downstream of the flow divider preventing reverse flow through the transfer circuit, and a piston responsive to transfer circuit pressure to meter fluid displaced from the bucket cylinder and prevent cavitation in the system.

3,563,138

DIFFERENTIAL PRESSURE RESPONSIVE DEVICE WITH DIAPHRAGM EQUALIZATION

James A. Symonds, Penfield, and John J. Callahan, Chili, N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed June 23, 1969, Ser. No. 835,400
Int. Cl. F01b *5/06*
U.S. Cl. 92—48 **11 Claims**



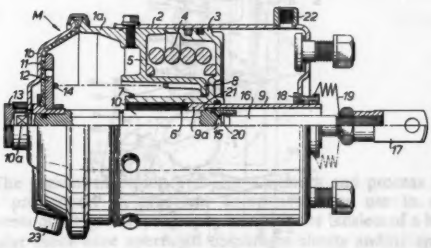
A pair of nominally identical diaphragms are rigidly interconnected with the end of a bar to deflect same. A connector on the end of the bar has an oblique circumferential track. Stems on the diaphragms are clamped in the track. To adjust for diaphragm differences, the stems are unclamped and the connector is rotated to shift the stems, the one stem moving toward the axis of bar deflection, and the other moving away therefrom. In this way, the difference between the diaphragms' responses to pressure is neutralized by difference in effective lever arm of said diaphragms on said bar. The connector may be in the form of two like cylinders, each having nonparallel bases and clamping the stems between them.

3,563,139

SPRING-APPLIED BRAKE MECHANISMS

Wilbur M. Page, Bracebridge Heath, Lincoln, and Ralph Coupland, Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England

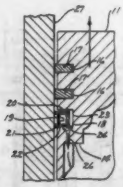
Filed Jan. 24, 1969, Ser. No. 793,703
Claims priority, application Great Britain, Jan. 26, 1968, 4176/68
Int. Cl. F01b *7/04*
U.S. Cl. 92—63 **9 Claims**



A vehicle braking system comprising an air pressure operated brake motor and a spring-applied fluid pressure released motor combined as a unit, said unit including in the spring motor a central sleeve movable with the piston thereof and in screw-threaded connection with a hollow release screw, said screw having operative connection with a push

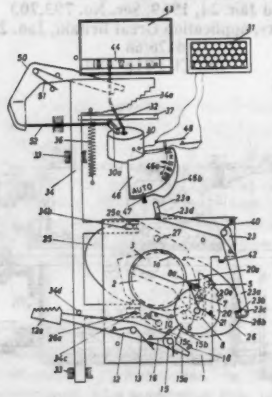
rod by which the thrust of the unit is transmitted to the brake linkage, and means for rotating the release screw to effect further movement of the piston beyond the "brakes-on" position to decompress the piston loading spring and release the brakes.

3,563,140
PISTON FOR AN INTERNAL COMBUSTION ENGINE
Carl W. Hollingsworth, 538 N. 2nd St., Marshalltown, Iowa 50158
Filed May 23, 1969, Ser. No. 827,318
Int. Cl. F01b 31/10
U.S. Cl. 92—160 1 Claim



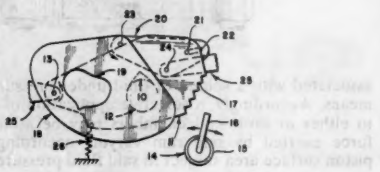
The piston has a lowermost ring-receiving groove formed adjacent the inner end of its bottom side with an annular oil-receiving trough. Oil removed from the cylinder wall by the piston ring during the down stroke of the piston is directed into the trough. A series of vertically extended circumferentially spaced holes in the trough function as drain holes for conveying the oil from the trough to the interior of the piston in response to the change in the directional travel of the piston on the completion of its downstroke travel.

3,563,141
PHOTOGRAPHIC CAMERA WITH AN AUTOMATIC, LIGHT-DEPENDENT EXPOSURE SETTING
Franz W. R. Starp, Calmbach, Black Forest, Germany, assignor to Prontor-Werk Alfred Gauthier GmbH, Calmbach, Black Forest, Germany
Filed Mar. 13, 1967, Ser. No. 622,548
Claims priority, application Germany, Mar. 12, 1966, P38,975
Int. Cl. G01j 1/04
U.S. Cl. 95—10 15 Claims



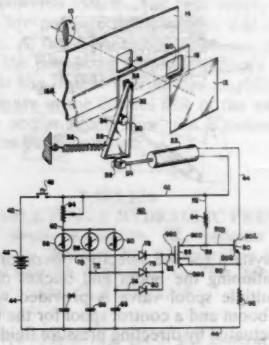
A photographic camera having a diaphragm consisting of at least two rotatably mounted blades and an exposure-time-regulating device cooperating with the shutter blade system of the camera, so that by means of an exposure meter built into the camera and a scanning device associated therewith, both light stop and exposure time are automatically controllable in an "AUTO" range and are presettable manually in another range. The camera has simple automatic programming whereby a part of the components of the automatic programming system is utilized for manually setting the light stop and the exposure time as well as for actuating a working range indicator by a highly advantageous configuration and correlation of parts with a minimum of structural expense. Thus, the camera has a control member, forming part of the exposure-time-regulating device and participating in the positioning motions of the diaphragm blades, that engages one of the diaphragm blades directly, and wherein its setting determines the duration of the exposure by the shutter sectors.

3,563,142
PROGRAMMED SHUTTER
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey
Filed Aug. 28, 1968, Ser. No. 755,869
Int. Cl. G03b 9/06, 7/00
U.S. Cl. 95—10 8 Claims



A photographic exposure control system utilizing a simple three-member programmed shutter and a needle trap meter movement. The indicating needle of conventional exposure meter is used to control the relative positions of the shutter members and thereby control the exposure aperture and exposure time provided by the programmed shutter in accordance with the level of field brightness of the subject to be photographed.

3,563,143
EXPOSURE CONTROL SYSTEM FOR DOCUMENT COPYING APPARATUS
Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed July 3, 1968, Ser. No. 742,431
Int. Cl. G03b 7/08, 9/62
U.S. Cl. 95—10 19 Claims



An exposure control system for document duplicating devices which utilizes a multibranch photosensing network to

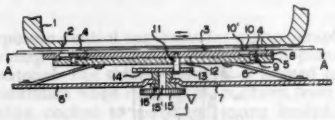
evaluate variations in reflection characteristics over select portions of a document to be duplicated. The embodiment shows an adjustment of exposure interval timing in correspondence with a reflection evaluation representing the brightest portion of the duplicated document.

3,563,144

PRESSURE PLATE FOR CAMERAS ADAPTABLE FOR FILM WITH OR WITHOUT BACKING PAPER

Kunihiro Fukino, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Aug. 1, 1968, Ser. No. 749,483
Claims priority, application Japan, Aug. 23, 1967, 42/72369
Int. Cl. G03b *19/00*
U.S. Cl. 95—11 3 Claims



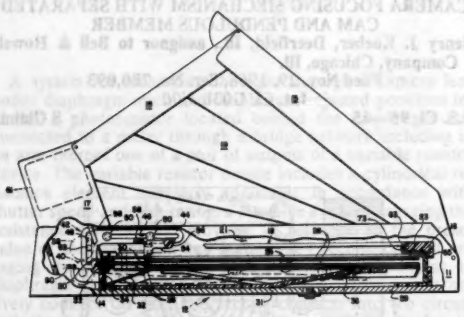
A pressure plate arrangement is provided for a roll film camera accommodating film strips with and without paper backing. A channel is provided between the film guide plate and the film guide surface on the camera body for guiding the film strip past a film exposure frame in the camera body. The clearance in the channel is variable through a selector knob on the exterior of the camera back, a stepped cam arrangement being provided to position the film guide plate relative to the film guide surface.

3,563,145

FILM TRANSPORTING APPARATUS

Leonard V. Bendoni, Hyde Park, and Irving Erlichman, Wayland, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed July 9, 1968, Ser. No. 743,441
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 14 Claims



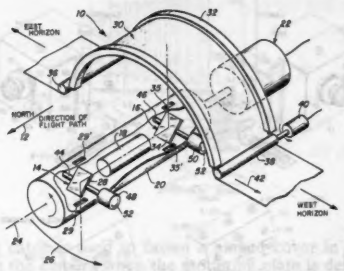
A self-developing camera including a pair of processing rolls which are mounted for movement away from each other when a film unit enters the nip of the rolls. A reciprocating film unit engaging member is coupled to one of the rolls for movement toward and away from a container housing a plurality of film units to move a film unit subsequent to exposure from the container into engagement with the rolls. The rolls rotate and the film unit engaging member reciprocates continuously and simultaneously and structure is provided for sensing the movement of one of the rolls away from the other to disenable the film unit engaging member to move another film unit from the container at least until the preceding film unit has advanced from engagement with the rolls.

3,563,146

SINGLE LENS PANORAMIC CAMERA

Joseph F. G. Miller, Lincoln, Mass., assignor to Itek Corporation, Lexington, Mass., a corporation of Delaware

Filed Apr. 15, 1968, Ser. No. 721,223
Int. Cl. G03b *37/02*
U.S. Cl. 95—16 14 Claims



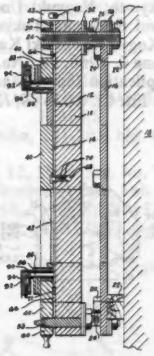
Apparatus for enabling a panoramic camera to make a plurality of scans of an area of interest during each revolution of the scanning mechanism, including deflection means for scanning the area of interest and means for moving the deflection means relative to an axis transverse to the axis of rotation of the scanning mechanism after a scan has been completed during a first portion of a revolution, to reorient the deflection means to perform another scan of the area of interest during another portion of that revolution.

3,563,147

MASTER CAMERA FOR PRODUCING COMPONENTS FOR INTEGRAL PHOTOGRAPHY

Roger L. De Montebello, 165 E.66th St., New York, N.Y.

Filed Oct. 11, 1967, Ser. No. 674,440
Int. Cl. G03b *35/00*
U.S. Cl. 95—18 7 Claims

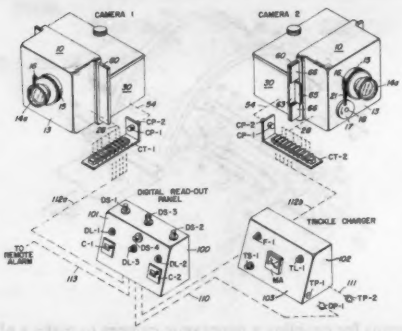


The present invention provides a camera and process for the production of precision components for use in the process of integral photography in which the lenslets of a lenticular sheet have apertured diaphragm sheets and/or apertured field-limiting sheets forming part of the lens system, the apertures being uniformly arranged in square, or more preferably hexagonal array. The camera also includes means for providing a negative to be exposed therein with accurate registering indices which serve to locate the negative and its derivatives so that all apertures as may be accurately coaxially registered with other apertures as well as with the lenslets of the lenticular sheet with which they are to be used.

3,563,148
AUTOMATIC SEQUENCE CAMERA AND SYSTEM

James J. Newman, Salem, Oreg., assignor to LeFebure Corporation, Cedar Rapids, Iowa

Filed June 4, 1968, Ser. No. 734,274
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 14 Claims

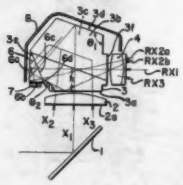


A remote controlled, sequence camera system for security purposes in banks and similar institutions, each camera featuring a self-contained power supply using a rechargeable battery, an extreme wide-angle lens with fixed focus and great depth of field, and a unique film drive system and circuitry incorporating unperforated roll film. One or more such cameras are connected into a single "digital readout panel" employing film counters, camera test circuits and a relay circuit which activates all cameras. The relay circuit may be connected into standard bank alarm systems and be activated in turn from one or more remote locations. Once activated, each camera continues to operate until shut off or until its film supply is exhausted. A trickle charger connected into the readout panel maintains the battery in each camera.

3,563,149
LIGHT-MEASURING SYSTEM EMPLOYING VIEWER SURPLUS LIGHT

Minoru Suzuki, Tokyo-to; Naoyuki Uno, 001-Machi, Irwmagun, and Tadazumi Sakazaki, Tokyo-to, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed June 6, 1968, Ser. No. 735,043
Claims priority, application Japan, Mar. 2, 1968, 43/13339
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 12 Claims

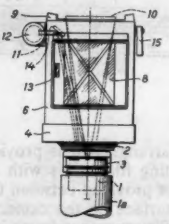


A through the lens light-measuring system includes a light-transmitting surface at the mirror-reflected focal plane of a reflex camera, a pentaprism having a bottom face confronting the light-transmitting surface, and an eyepiece directed to the prism rear face. Opposite side sections of the prism face are transparent and outside the viewing area of the eyepiece and an upwardly facing photocell is located proximate the bottom edge of each side section and a prism of other reflector directs the image rays reflected from the prism roof through the side sections onto the photocells. One of the photocells is provided with a lens for focusing part of the image. In an alternative form the photocells face the prism rear face on opposite sides of the eyepiece and are oblique to the optical axis to compensate for light intensity differences consequent to differences in angles between the photocell and the observed image, one of the photocells being provided with a focusing lens for part of the image.

3,563,150
BELLOWS CAMERA HAVING REFLEX MIRROR AND AUTOMATIC EXPOSURE CONTROL

Heinrich Klemann, Burgsolms, Herbert Leiter, Garbenheim, and Klaus Weber, Wetzlar, Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed June 14, 1968, Ser. No. 737,040
Claims priority, application Germany, June 15, 1967, L56753
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 3 Claims

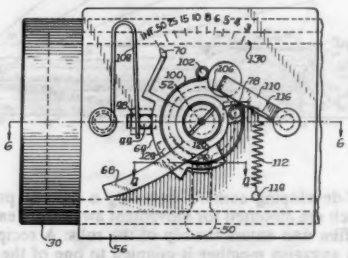


In a bellows camera for particular use on microscopes for photomicrographic purposes there is disposed a pivotable reflex mirror in front of the film plane, which mirror is adapted to reflect the image-forming light rays to a viewing screen. A first diaphragm is arranged in a plane conjugate to the film plane but laterally spaced from the cone of image-forming rays, and a light-sensitive element is placed behind said diaphragm. A second diaphragm is provided in the plane of the viewing screen through which diaphragm the reflex mirror in its viewing position reflects the same rays that are incident on the light-sensitive element when said reflex mirror is in its exposure position.

3,563,151
CAMERA FOCUSING MECHANISM WITH SEPARATED CAM AND PENDULOUS MEMBER

Henry J. Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 29, 1968, Ser. No. 780,093
Int. Cl. G03b *3/00*
U.S. Cl. 95—45 8 Claims



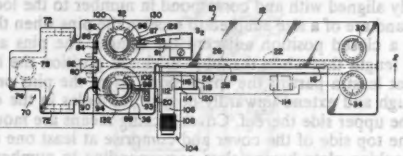
A focusing mechanism for adjusting the lens of a camera according to camera-to-subject distance determined by angular orientation of a pendulous member. The lens is adjusted by a cam which is separate from but oriented in response to the position of the pendulous member. A control is manually operable to adjust the lens independently of orientation of the pendulous member.

3,563,152

EXPOSURE CONTROL APPARATUS

Lawrence M. Douglas, Brockton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 1, 1968, Ser. No. 741,741
Int. Cl. G03b 9/28
U.S. Cl. 95—57 6 Claims



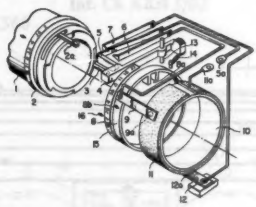
An exposure control apparatus for a photographic camera incorporating a shutter blade formed from planar resilient spring material. The shutter material is formed to assume a spiral orientation when relaxed and is drawn from this orientation when cocked to assume a spring loaded condition. Release of the blade from this spring loaded orientation permits its exposure influencing movement about an exposure aperture.

3,563,153

CAMERA LIGHT MEASURING SYSTEM

Koichiro Watanabe, Tokyo-to, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 21, 1968, Ser. No. 754,435
Claims priority, application Japan, Sept. 21, 1967, 42/60745
Int. Cl. G03b 7/02
U.S. Cl. 95—64 6 Claims



A system for measuring the light through a camera lens under diaphragm-open and diaphragm-adjusted positions includes a photoresistor located behind the diaphragm and connected to a meter through a bridge network including in an arm thereof one of a pair of outputs of a variable resistor device. The variable resistor device includes a cylindrical resistance element angularly adjustable in accordance with shutter speed and film rating, a movable contact engaging the resistance element and movable in response to the preset value of the diaphragm and a stationary second contact engaging the resistance element at a point corresponding to diaphragm-open position. A switch is actuatable to alternatively connect the first and second contacts into the circuit with the full opening and adjusted closing of the diaphragm respectively.

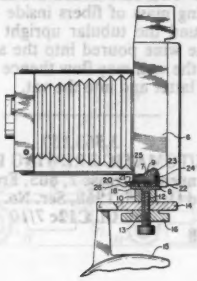
3,563,154

TRIPOD MOUNTING ATTACHMENT FOR CAMERAS

Donovan E. Henning, Box 38 R.R. 1, Egan, Ill. 61026

Filed July 12, 1968, Ser. No. 744,534
Int. Cl. G03b 17/56
U.S. Cl. 95—86 6 Claims

A camera mounting plate that is easily attachable to a camera has a nut affixed onto its lower side to receive the usual screw on a tripod for fastening the camera thereon. The plate is rectangular and has an upwardly projecting flange on one edge with two spaced inwardly projecting ears on it to engage over and grip an edge portion of one wall of the camera case. The camera case has an outwardly projecting spring catch which snaps over the flange between the ears to fasten the camera detachably onto the mounting plate.



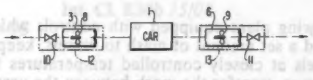
The spring catch is used to fasten a hinged cover in closed position on the camera when the mounting plate is detached therefrom.

3,563,155

VENTILATING EQUIPMENT FOR HIGH SPEED TRAIN

Masahiko Ishizawa, Tokyo, and Takio Fujioka, Kudamatsu-shi, Japan, assignors to Japanese National Railways and Hitachi, Ltd., Tokyo, Japan

Filed Dec. 27, 1968, Ser. No. 787,430
Claims priority, application Japan, Dec. 27, 1967, 42/83,307
Int. Cl. F24f 7/00
U.S. Cl. 98—8 7 Claims



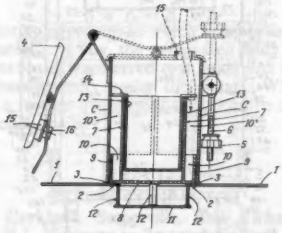
A ventilating equipment for high-speed trains in which the differential flow rate between supply-air and exhaust-air is kept within certain limits to minimize an unpleasant sensation on the part of the passengers, for example, as the train passes through a tunnel at high speeds.

3,563,156

FILTERING APPARATUS CONTAINING VEGETABLE FIBERS

Albert Oreste Del Gamba, 201-203, bld. de la Madeine, Nice, France

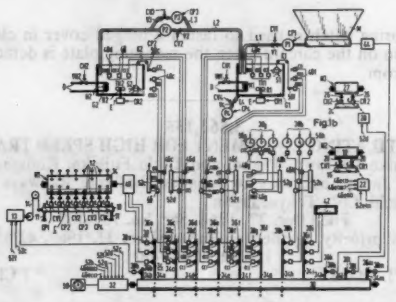
Filed Feb. 12, 1969, Ser. No. 798,661
Claims priority, application France, Feb. 16, 1968, Oct. 15, 1968, PV9028;PV9451
Int. Cl. A12h 1/22
U.S. Cl. 99—277.1 5 Claims



An arrangement for protecting the filtering fibers inside a wine-treating vat to protect it against premature soiling, said arrangement comprising a preliminary filter constituted by a

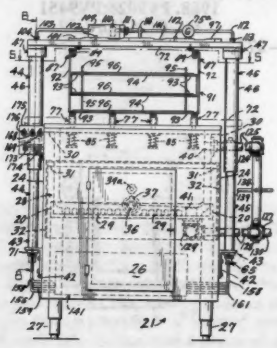
small mass of filtering fibers filling a short tubular upright rising above the conventional opening in the upper cover of the vat which is assumed to be completely filled with filtering fibers. The small prefiltering mass of fibers carried for instance by a basket removably fitted inside the upright can be readily replaced. This ensures a much longer life for the actual large filtering mass of fibers inside the vat. An annular wall may surround the tubular upright and rise above the latter so that the wine poured into the annular gap between the upright and the wall may flow thence over the edge of the upright into the latter and into the vat.

3,563,157
AUTOMATIC BREWING PLANT
Conrad Lenz, Annenhofstrasse 2, 805, Freising, Germany
Filed Oct. 15, 1968, Ser. No. 767,627
Int. Cl. C12c 7/10
U.S. Cl. 99—278 **9 Claims**



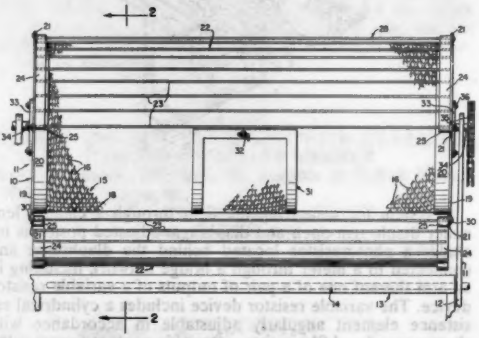
A brewing plant equipped with controls which automatically feed a set amount of mash to vessels, keep the mash in the vessels at closely controlled temperatures for predetermined times, transfer the mash between the vessels, and ultimately discharge it to a lautertub. The manifold control functions are distributed between a master control unit and auxiliary control mechanisms, each of which controls more than one aspect of the brewing process and is itself controlled by the master unit.

3,563,158
PRESSURE COOKING APPARATUS
Harold K. Omer, Englewood, Ohio, assignor to Cheftron, Inc., Lima, Ohio, a corporation of Ohio
Filed Apr. 28, 1969, Ser. No. 819,748
Int. Cl. A47j 37/12
U.S. Cl. 99—326 **9 Claims**



Apparatus for the pressure frying of chicken and other foodstuffs in oil or shortening which includes a support base, an open topped pot for holding frying oil that is mounted on the base and which has a horizontal flange surrounding the top thereof, a cover for the pot and means for heating the pot. There are hydraulic cylinder means mounted at each side of the pot, and the cover is carried on the hydraulic cylinder means for vertical movement relative to the pot. A plurality of locking pins are mounted vertically in the flange, each of the pins having a shank and an enlarged head above the shank. The cover has vertical holes in its edges which are axially aligned with and correspond in number to the locking pins and are of a size adapted to receive the pins when the lid is in a closed position adjacent the flange. The pins are of such length that when the lid is in closed position the heads and at least a part of the shank portions of the pins project through and extend upwardly beyond the holes in the cover on the upper side thereof. Cover locking means are mounted on the top side of the cover and comprise at least one slidable locking plate having slots corresponding in number and location to the locking pins. Each of the slots is keyhole shaped with the enlarged ends all arranged in the same direction. Means are provided for moving the locking plate between a first, unlocked position with the enlarged ends of the slots aligned with the pins and a second, locked position with the narrower ends of the slots aligned with the locking pins. When the cover is closed and the locking plate is in locking position, the narrower parts of the plate embrace the shanks of the pins to hold the cover tightly closed. The apparatus includes a hydraulic system for actuating the cover lifting cylinders and the locking plate and electrical circuitry for automatically cycling the apparatus to repeatedly cook measured batches of chicken or other food.

3,563,159
ROTISSERIE
Martha Johnson, 1666 Eleventh Ave., Huntington, W. Va.
Filed Jan. 14, 1969, Ser. No. 790,947
Int. Cl. A47j 37/04
U.S. Cl. 99—339 **3 Claims**

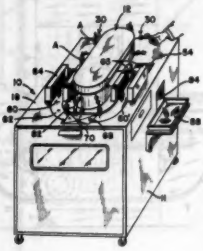


A rotisserie or cooking appliance that includes a rotary drum that has openings therein, a shell or housing surrounding the drum and provided with a plurality of sections that are provided with members for holding food products thereon that are to be barbecued or cooked and a novel means for applying heat to the food products.

3,563,160
AUTOMATIC APPARATUS FOR BROILING SPITTED FOODS
Kaiichi Otsuka, Tokyo, Japan, assignor to Torlichi Shoji Kabushiki Kaisha, Tokyo, Japan, a corporation of Japan
Filed Feb. 3, 1969, Ser. No. 795,887
Claims priority, application Japan, Feb. 6, 1968, 43/7714
Int. Cl. A47j 37/04
U.S. Cl. 99—345 **6 Claims**

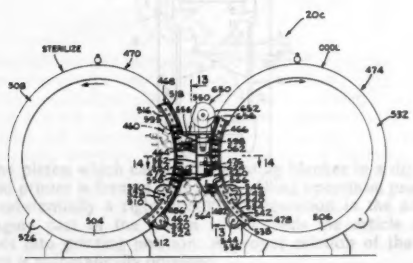
An automatic apparatus for broiling foods in the spitted form in which the spits of food are hung down from the hold-

ing arm of the circulating carrier are heated and then soy or the like liquid seasoning is applied and heated again and



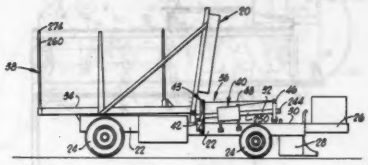
finished. Finished food is automatically released from the holding arm and received in a tray.

3,563,161
ROTARY PRESSURE COOKER
Samuel A. Mencacci, Wilrijk, Belgium, assignor to International Machinery Corporation S.A., St. Niklaas-Waas, Belgium
Original application Aug. 3, 1967, Ser. No. 658,105, now Patent No. 3,495,523, dated Feb. 17, 1970. Divided and this application Feb. 3, 1969, Ser. No. 823,212
Int. Cl. A23l *3/02*
U.S. Cl. 99—366 10 Claims



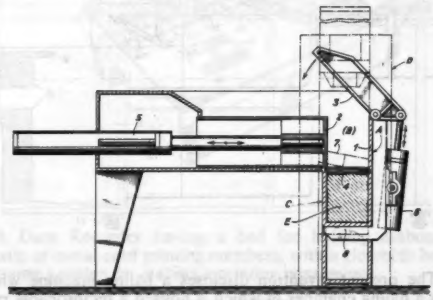
A high capacity, low speed rotary cooking and cooling apparatus for handling cooker length rows of containers within a series of annular processing housings interconnected by star wheel transfer turrets. A reel in each housing arranged to move each container around an arcuate path, and at least one of said annular housings being of sufficient size to encompass another housing. The apparatus may include pressure feed and discharge valves capable of handling an entire row of containers at one time; or may include shorter pressure feed and discharge valves which handles shorter rows that are less than an entire cooker length row at one time and which are associated with an intermittently driven conveyor that accumulates the short rows and forms them into cooker length rows which are then deflected between the transfer conveyor and the adjacent housing. A modified apparatus includes one or more cylindrical housings with an inner drum that may be driven at a speed different from that of the reel so as to agitate the cooker length rows of containers.

3,563,162
BALE WAGON INCLUDING A BINDER ASSEMBLY
Joe B. Monroe, Box 278, Cherokee, Okla.
Filed May 21, 1969, Ser. No. 826,450
Int. Cl. B65b *13/18*
U.S. Cl. 100—7 27 Claims



A bale wagon for transporting, loading, and unloading a stack of bales, having a binder assembly thereon to secure a layer of bales into position, prior to the formation of a stack of bales, thereby providing a more stable and secure stack of bales, and having a stack-retrieving assembly to more efficiently and effectively load and unload a stack of bales.

3,563,163
SCRAP SHEARING APPARATUS
Helmut Schoenauer, Kalkumer-Schlossallee, 4 Duesseldorf-Kaiserswerth, Germany
Filed Jan. 21, 1969, Ser. No. 792,438
Claims priority, application Germany, Jan. 27, 1968, P 16 52 783.6
Int. Cl. B30b *15/08*
U.S. Cl. 100—95 6 Claims

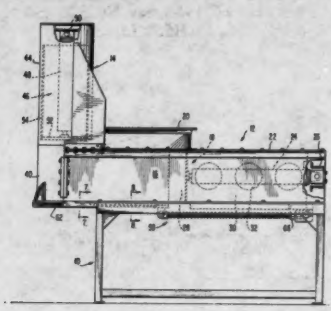


Scrap shearing apparatus in which scrap is first compacted in a preconsolidating box, the compacted body of scrap then being automatically transferred to a guide box from which it is moved incrementally under the shears. Whilst shearing takes place a further quantity of scrap can be compacted in the preconsolidating box.

3,563,164
REFUSE COMPACTOR
George A. Carkhuff, Somerville, and Richard Jakoplic, Somerset, N.J., assignors to Research Cottrell, Inc., Bridgewater Township, Somerset County, N.J.
Filed Mar. 14, 1969, Ser. No. 808,053
Int. Cl. B30b *15/32*, *15/08*
U.S. Cl. 100—98 8 Claims

An apparatus for compacting refuse having a chamber with

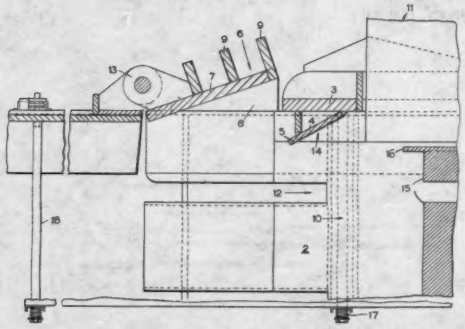
horizontal and vertical compacting rams communicating therewith. The rams cooperate to sequentially compress refuse for ultimate discharge from the chamber as a uniform, discrete slug of compacted refuse.



3,563,165
BALING MACHINES

Walter N. Powell, 5 Church Lane, St. Helens, Lancashire; Allan F. Powell, 10 Oak Close Weston, Prescot, Lancashire, and Henry Anderton, 24 North Park Road, Kirkby, Lancashire, England

Filed July 30, 1968, Ser. No. 748,713
Int. Cl. B30b *15/08*
U.S. Cl. 100—98 **7 Claims**



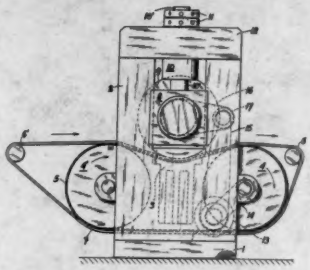
The present invention discloses a baling machine which has a baling chamber in which is housed a reciprocable ram. One wall of the baling chamber has a wedge-shaped cavity which provides relief for any overpressure which may occur while the ram is in operation, in the chamber. Also, adjacent to the wedge-shaped cavity and arranged within the chamber, is a tucker which folds the edges of the feed material to produce a uniform baling configuration, material weakening means also being provided in the chamber to facilitate the folding of feed material edges by the tucker.

3,563,166
ROTARY PRESS

Karel Bajak and Vaclav Oplustil, Krnov, Czechoslovakia, assignors to Strojosvit narodni podnik, Krnov, Czechoslovakia

Filed July 24, 1968, Ser. No. 747,162
Claims priority, application Czechoslovakia, Aug. 7, 1967, 5679/67
Int. Cl. B30b *3/00, 5/04*
U.S. Cl. 100—153 **4 Claims**

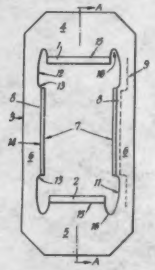
A rotary press for smoothing or embossing leather and like flat objects has a rotating pressure cylinder which cooperates with a concavely cylindrical trough on a stationary anvil. The object to be pressed passes through the trough between the cylinder and a laminar belt arrangement moving at the circumferential speed of the roller. The belt arrangement includes an abrasion resisting metal drive belt slidingly engaging the anvil, and a supporting belt of resilient material interposed between the drive belt and the pressed object.



3,563,167
FRAMES FOR PRESSES

John Antony Pennell, Cumberland, and Alan Saunders, Co. Durham, England, assignors to Vickers Limited, London, England

Filed July 26, 1968, Ser. No. 747,857
Claims priority, application Great Britain, July 26, 1967, 34475/67
Int. Cl. B30b *1/00, 1/32*
U.S. Cl. 100—214 **9 Claims**



A press frame made up from a number of platelike subframes, each defining a frame opening, disposed with the frame openings in registry, and interconnected by two platens or part platens secured, in facing-spaced relationship in the registering frame openings, across facing inner edges of opposing members of each subframe. Slide surfaces are also provided in the press frame openings substantially perpendicular to the platens, by or on plates each secured across corresponding inner edges of the members of at least two adjoining subframes.

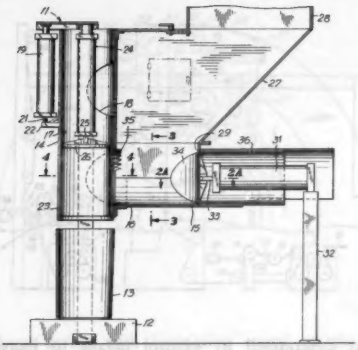
3,563,168
GARBAGE COMPACTING APPARATUS

William Doninger, Merrick, N.Y., assignor to Combustion Equipment Associates, Inc., New York, N.Y., a corporation of New York

Filed June 18, 1969, Ser. No. 834,446
Int. Cl. B30b *15/30*
U.S. Cl. 100—215 **12 Claims**

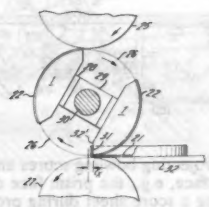
Garbage compacting apparatus in which garbage is delivered into a first chamber, fed from the first chamber to a second chamber formed by a sleeve which is advanced into a

receptacle and compacted in the sleeve within the receptacle. On completion of compaction, the sleeve is retracted



from the receptacle and the garbage is ejected from the sleeve to leave the garbage deposited in the receptacle.

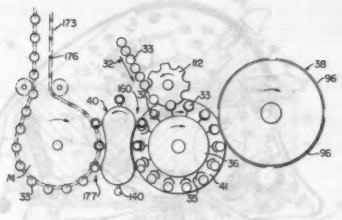
3,563,169
APPARATUS FOR PRINTING ARTICLES HAVING AN UPSTANDING FLANGE AROUND THEM
John C. Hovekamp, Elyria, Ohio, assignor to Wood Industries, Inc., Plainfield, N.J.
Filed Sept. 9, 1968, Ser. No. 758,451
Int. Cl. B41f *17/36*
U.S. Cl. 101—36 **1 Claim**



The platen which carries the printing blanket in a dry offset lid printer is formed by a radial milling operation, producing substantially a right conoid configuration in the article engaging part of the platen which feeds the article as it comes into printing position. A proper relation of the elements is automatically obtained.

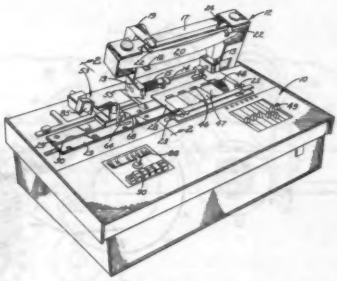
3,563,170
MACHINE FOR MARKING THE EXTERIOR CYLINDRICAL SURFACES OF CANS IN A CONTINUOUS NONINDEXING MANNER
Daniel S. Cvacho and Field I. Robertson, Jr., Chesterfield County, Va., assignors to Reynolds Metals Company, Richmond, Va.
Continuation-in-part of application Ser. No. 601,135, Dec. 12, 1966, now Patent No. 3,496,863. This application Apr. 16, 1968, Ser. No. 721,787
Int. Cl. B41f *17/22*; **B65g** *47/52*
U.S. Cl. 101—40 **19 Claims**

A machine for continuously marking the exterior surfaces of cylindrical containers having a continuously rotatable nonindexing cradle-supporting wheel which carries a plurality of cradles about its outer periphery with each of the cradles adapted to receive an associated container from a precision infeed device. The infeed device uses a star wheel to assure rapid and positive placement of each container on an associated cradle in a stable manner. The machine also has a simple pickoff apparatus comprised of a fixed track which supports a plurality of vacuum devices for movement thereon and the vacuum devices operate to move the cans away from



the machine after they have been printed without decreasing the operating speed of the machine.

3,563,171
INTERLOCK MEANS FOR PRINTING DEVICES IN DATA RECORDERS AND TRANSMITTERS
Donald N. Heisner, Mentor, and Russell A. Hansen, Chardon, Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio, a corporation of Delaware
Continuation of application Ser. No. 698,499, Jan. 17, 1968, now abandoned. This application Dec. 12, 1969, Ser. No. 880,505
Int. Cl. B41j *25/32*, *29/40*
U.S. Cl. 101—45 **10 Claims**

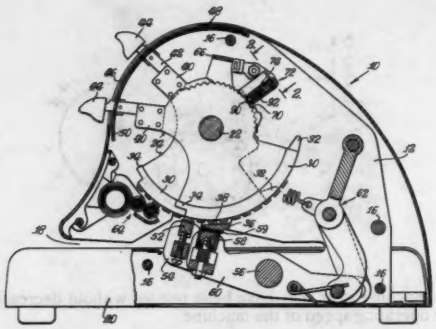


A Data Recorder having a bed for holding embossed plastic or metal card printing members, with a closeable head carrying a platen for making a printing impression.

3,563,172
INDEX BAR AND DETENT MEANS IN CHECK WRITERS AND SELECTIVE PRINTING MACHINES
Ardath A. Gopperton, Mount Prospect, Ill., assignor to Theodore B. Hirschberg, Jr., Chicago, Ill.
Filed Dec. 12, 1968, Ser. No. 783,193
Int. Cl. B41j *5/24*, *7/34*
U.S. Cl. 101—95 **5 Claims**

An index bar for use with check writers and money order printing machines and the like having frame means defining a printing line and a plurality of type segments adjustable to position printing characters on the printing line. The index bar includes an elongated body supported by the frame and having a plurality of transverse bores each of which receives a ball detent for operative association with a rack portion of a corresponding type segment to releasably maintain the type segment in a selected position. Certain of the bores are disposed in offset spatial relation relative to the next adjacent bores to allow the type segments associated with the offset bores to be supported in closer spaced relation than is possible with the bores aligned longitudinally along the index bar.

One embodiment of the index bar has the axes of the offset bores disposed in parallel relation, while an alternative embodiment disposes the axes of the offset bores in radial alignment with the axis of rotation of the type segment members.



3,563,173

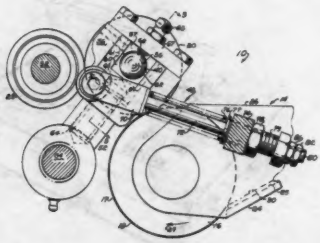
LIQUID-HANDLING MECHANISM

Charles A. Harless, Fort Worth, Tex., assignor to Harris-Intertype Corporation, Cleveland, Ohio, a corporation of Delaware

Continuation of application Ser. No. 624,801, Mar. 21, 1967, now abandoned. This application Sept. 19, 1969, Ser. No. 859,535

Int. Cl. B41l *25/16, 25/18;* **B41f** *31/12*

U.S. Cl. 101—148 **10 Claims**



A liquid-handling mechanism in which a ductor roll receives liquid from a fountain roll and transfers it to a distributing or transfer roll. The ductor roll is maintained in peripheral engagement with the distributing roll and has an inner body portion concentric with respect to its axis of rotation and a covering or sleeve which has an outer surface eccentric with respect to the axis of rotation of the ductor roll so that the ductor roll moves toward and from the fountain roll during each revolution thereof. Also, the ductor roll is supported by an adjustable support assembly for the ductor roll which enables the ductor roll to be adjustably positioned laterally toward and from the fountain roll while maintaining a pressure relationship with the transfer roll.

3,563,174

WEB TENSIONING WITH ADJUSTABLE COUNTERWEIGHTS FOR CONTROLLING THE SPACING OF IMPRINTS

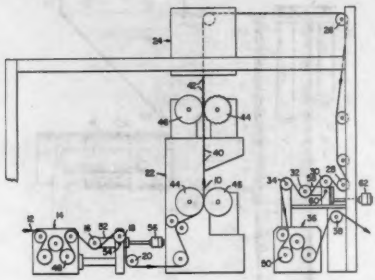
Donald C. Anderson, Lafayette, and Momir Kodich, El Cerrito, Calif., assignors to Hexcel Products, Inc., Berkeley, Calif.

Continuation of application Ser. No. 587,716, Oct. 19, 1966, now abandoned. This application Nov. 20, 1969, Ser. No. 871,709

Int. Cl. B41f *13/02*

U.S. Cl. 101—225 **3 Claims**

A sheet-handling apparatus in which a sheet is moved past a printing assembly and which has independent first and second variable force sheet tensioning devices disposed upstream and downstream, respectively, of the printing assembly. The forces exerted by the tensioning devices are varied as determined by control means to increase or decrease the speed with which the sheet moves past the printing assembly and thereby control the relative position of imprints from the assembly on the sheet.



3,563,175

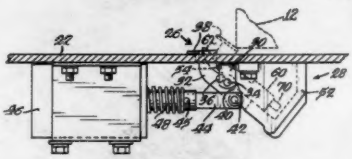
SCORE SHEET HOLD-DOWN AND SENSING DEVICE

Robert Torresen and William M. Crimmins, Muskegon, Mich., assignors to Brunswick Corporation

Filed Sept. 23, 1968, Ser. No. 761,700

Int. Cl. B41f *1/28, 1/60*

U.S. Cl. 101—322 **9 Claims**



A device for projecting bowling scores and the like including a support surface, e.g., the prism face of a prism projector, for supporting a score sheet during projection, operable holding or clamping means, for clamping the sheet in proper position on the surface, and detection means for detecting the presence of the sheet in proper clamped position. A printer can be mounted for movement relative to the support surface between a retracted position removed from the surface and a printing position overlying the surface and the printer can be automatically shut off or rendered inoperable responsive to a "paper absent" condition as detected by the detection means. The clamp can be moved to an unclamping position responsive to movement of the printer to retracted position, e.g., by limit switch actuation of a solenoid. The clamp can also be arranged to be moved to clamping position responsive to movement of the printer to printing position, e.g., by camming action of the printer housing.

3,563,176

CLAMPING AND TIGHTENING DEVICE FOR BLANKETS AND FLEXIBLE PRINTING PLATES

James McIntyre Ferguson, Teaneck, N.J., assignor, by mesne assignments, to Wood Industries, Inc., Plainfield, N.J., a corporation of Virginia

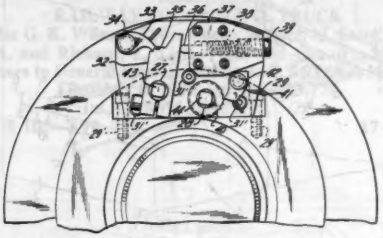
Filed July 1, 1968, Ser. No. 741,584

Int. Cl. B41f *1/28, 21/00*

U.S. Cl. 101—415.1 **1 Claim**

Device for clamping and tightening of a printing blanket on an impression cylinder and/or a flexible printing plate on a plate cylinder of a printing machine. A cam-shaped clamping rod under spring pressure for one edge of the blanket and/or the flexible plate and a separate tightening rod on which the other end of the blanket and/or the flexible plate is

wound. The cam-shaped clamping rod is also designed for a clamping force which increases under the influence of the

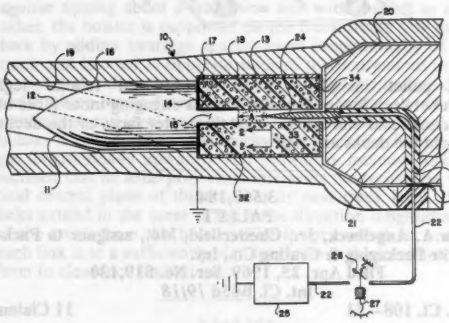


centrifugal forces with increasing speed of the printing machine.

3,563,177
CASELESS AMMUNITION AND IGNITION MEANS THEREFOR

Harold W. Ritchey, Langhorne, Pa., assignor to Thiokol Chemical corporation, Bristol, Pa.

Filed June 14, 1968, Ser. No. 737,128
Int. Cl. F42b *9/16*
U.S. Cl. 102—38 **15 Claims**



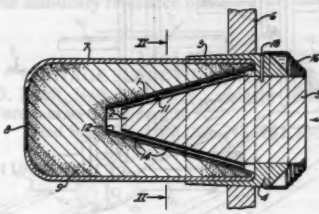
A caseless charge for firearms and a firearm therefor, said charge being porous and made from comminuted or particulated combustible materials having the surface of each particle thereof softened with a solvent. The softened material is consolidated in a combustible pyroxylin tube and inserted in the firearm. Ignition is provided from an electrical discharge between the end of an ignition probe and the projectile attached to the charge.

3,563,178
MECHANICAL PRIMER

Allen Scott Caples, Baltimore, Md., assignor to Catalyst Research Corporation, Baltimore, Md., a corporation of Maryland

Filed Feb. 19, 1969, Ser. No. 800,572
Int. Cl. F42b *19/10*
U.S. Cl. 102—86.5 **7 Claims**

A rigid conical ram extends into an expandable perforated cone, but is spaced from it. The opposed surfaces of the cone and ram are coated with different components of pyrotechnic material that will ignite when brought together and subjected to compression and shear forces. The ram is supported for longitudinal movement so that it can be moved further into

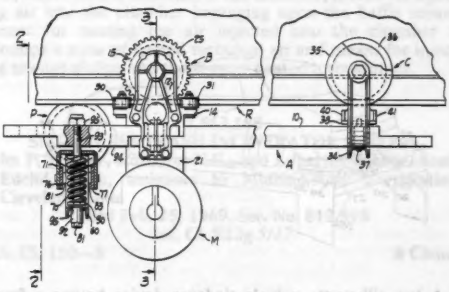


the cone in order to rub the pyrotechnic coatings together under pressure. The ignited material ignites other material around the cone.

3,563,179
SUSPENDED RAILWAY LOCOMOTIVE

Henry A. Gorjanc, Mentor, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed Aug. 28, 1968, Ser. No. 755,933
Int. Cl. B61b *3/02*; B61c *11/00*; E01b *25/22*
U.S. Cl. 104—95 **7 Claims**



An overhead monorail carrier-type material-handling system having an articulated assembly movable along an inverted T-shaped monorail and including a drive unit comprising drive wheels engaging one side of the projecting rail flanges and a pressure-producing or traction-increasing unit having pressure wheels biased against the other side of the rail flanges and connected to the drive unit for movement only about an axis nonparallel to the axes of rotation of the drive and pressure wheels.

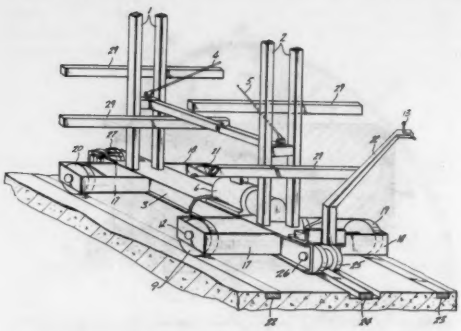
3,563,180
MOVABLE STORAGE RACK

Melvin C. Rutledge, Riverside, Calif., assignor to Olin Corporation

Filed Jan. 24, 1969, Ser. No. 793,843
Int. Cl. B60m *7/00*; B61f *9/00*
U.S. Cl. 104—148 **1 Claim**

In a rack type storage means the improvement comprising at least two wheels operatively connected to said rack means,

means for driving at least one of said wheels, at least one guide in a position removed from said rack means and at least one guide follower connected to said rack means and in operative engagement with said guide.



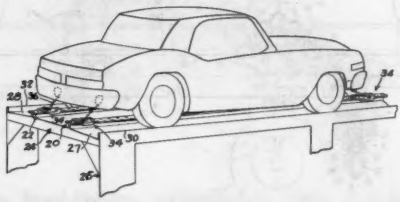
ERRATUM

For Class 105—199 see:
Patent No. 3,563,185

3,563,181
LOW CLEARANCE VEHICLE TIEDOWN

Walter F. Mietla, Dearborn, Mich., assignor to Portec Inc., Chicago, Ill.

Filed Dec. 6, 1968, Ser. No. 781,826
Int. Cl. B61d *45/00*; B60p *7/00*
U.S. Cl. 105—369 **10 Claims**



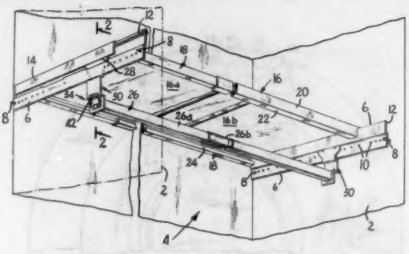
A low silhouette vehicle tiedown device having a frame plate which slidably grips the cross flange of a T-beam of a cargo carrier for movement only along the beam. A dog is mounted for limited universal movement adjacent the plate and is spring biased against the plate. The free end of the dog carries a locking pin which by manipulating the dog is insertable into a hole in the plate for registry of the pin in a hole in the T-beam to lock the tiedown against movement along the T-beam. One or two dogs and variations in plate hole arrangement are disclosed to provide incremental adjustment of the tiedown at intervals less than that of the T-beam hold spacing.

3,563,182
COMBINED SHELVING AND CLOTHES BAR APPARATUS

Walter J. MacFarlane, Kensington, and Edmund F. Reiss, Newington, Conn., and Joffre E. R. Hentzi, Dunedin, Fla., assignors to The Stanley Works, New Britain, Conn.

Filed Aug. 12, 1968, Ser. No. 751,966
Int. Cl. A47b *57/00*
U.S. Cl. 108—29 **12 Claims**

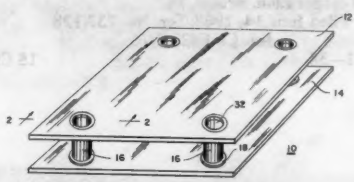
A combined shelf and clothes bar structure adapted to be fastened inside of various sized clothes closets. Support members for the shelf and clothes bar may be secured by mounting devices either to the sidewalls or back wall of the closet and the entire structure easily installed without the use of special tools.



3,563,183
PALLET CONSTRUCTION

Howard B. Rich, 2533 NE. 37th St., Fort Lauderdale, Fla.

Filed Dec. 26, 1968, Ser. No. 786,873
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **2 Claims**



A pallet including spaced decks and tubular legs therebetween having doubled flanges engaging inner faces of the decks and end flanges engaging outer faces of the decks to hold the decks and legs assembled.

3,563,184
PALLET

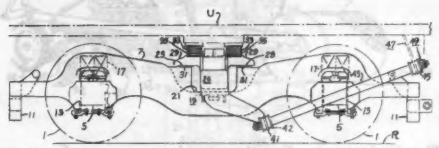
John A. Angelbeck, Jr., Chesterfield, Mo., assignor to Pack-Rite Packaging & Crating Co., Inc.

Filed Apr. 25, 1969, Ser. No. 819,130
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **11 Claims**

A pallet used for the storage and transporting of containers such as beer kegs and the like. The pallet is formed as a unitary plastic member in a rotational molding operation and includes a pair of spaced outer skins which are internally connected by a plurality of properly spaced webs for internal strength. The skins also have a plurality of strategically located apertures which extend through each of the skins. The pallet has a plurality of downwardly extending shoulders for engagement with containers on its underface and is also

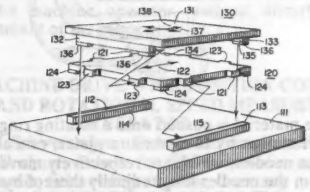
provided with supporting areas on its upwardly presented surface for removably supporting a plurality of like containers.

3,563,185
RAILWAY LOCOMOTIVE TRUCK
Douglas G. K. Wilmot, Creve Coeur, Robert, M. Seely, Florissant, and Richard, L. Lich, Town and Country, Mo., assignors to General Steel Industries, Inc., St. Louis, Mo.
Filed July 8, 1968, Ser. No. 743,178
Int. Cl. B61f *5/14, 5/16, 5/22*
U.S. Cl. 105—199 **17 Claims**



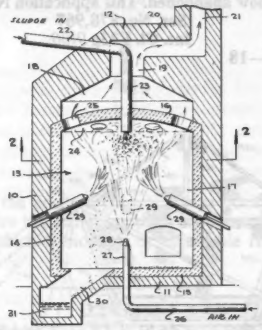
A railway motor truck for swivelly supporting a vehicle body and connected to the same for the transmission thereto of draft and braking forces at a sufficiently low level to minimize load transference between the axles. The truck comprises a rigid frame resiliently supported on the axles and a transverse bolster supported on the frame for swivel about its center. To provide for relative lateral movement of the body with respect to the truck while preventing substantial vertical movement of the body on the bolster, flat elastomeric pad devices are carried by the bolster at the sides of the truck for directly supporting the body. To minimize the overall height of the truck, the truck frame side members are depressed between the axles and the bolster extends through the depressions. To stabilize the bolster and truck frame against tipping about a transverse axis with respect to each other, the bolster is supported on the truck frame side members by sliding bearings spaced apart longitudinally of the truck and located at opposite sides of the depressions in the truck frame side members. For transmitting longitudinal draft and braking forces from the truck to the vehicle body substantially at rail level so as to minimize load transference, the bolster is connected to the vehicle body at each side by a single longitudinally upwardly and outwardly inclined link, so inclined that its axial projection intersects the transverse vertical central plane of the truck at or near track level. Both links extend in the same in the same direction longitudinally of the truck from the bolster. The lower, or bolster end of each link is at a sufficiently high level above the track to conform to clearance limitations.

3,563,186
BIDIRECTIONAL POSITIONING STAGE
Paul V. Piper, Hayward, and Harold B. Wells, Oakland, Calif., assignors to The Singer Company
Filed Oct. 30, 1968, Ser. No. 771,923
Int. Cl. A47b *11/00*
U.S. Cl. 108—143 **4 Claims**



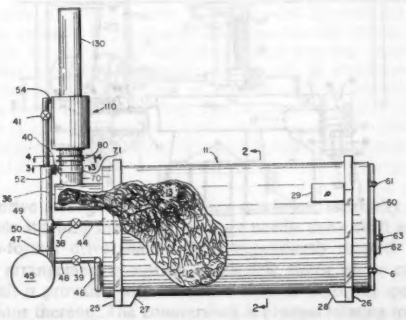
A bidirectional stage is disclosed in which the said bidirectional stage may be moved independently in either of two directions while maintaining contact with a stationary reference plane. A guide or motion control member is provided between the reference member and plane and the bidirectional member. The guide member is restricted to a first linear reciprocal motion with respect to the reference member; while the bidirectional stage is restricted to a second linear reciprocal motion with respect to the guide member. The guide member does not support or provide any planar reference for the bidirectional member which refers only to the stationary reference plane.

3,563,187
SEWAGE SLUDGE INCINERATOR
Auram B. Zanft, New York, N.Y., assignor to Hagan Industries, Incorporated, Corona, N.Y.
Filed Sept. 20, 1968, Ser. No. 761,130
Int. Cl. F23g *5/12*
U.S. Cl. 110—7 **15 Claims**



A sewage sludge incinerator including a chamber having a flue, baffle means mounted in the chamber, means for injecting air into the chamber impinging upon the baffle means, means for heating the air injected into the chamber to produce a zone of heated turbulent air and means for injecting sewage sludge into the zone of heated turbulent air.

3,563,188
SMOKELESS TRASH INCINERATOR SYSTEM
John P. Prosser, Roxboro, N.C., and Lubertus Bakker, South Euclid, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio
Filed Feb. 25, 1969, Ser. No. 812,518
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 **8 Claims**



An incinerator unit for disposal of a variety of waste materials having an initial burning chamber of ovoid section providing a lower trash-burning zone and an upper heat-reflecting zone having a narrowed portion of parabolic sec-

tion, an air supply system for presenting air under the fire and over the fire, and an afterburner system arranged along a stack for the incinerator.

The afterburner system provides a supplemental air supply and a preassembled fuel-supported burner unit disposed thereabove. Vertically spaced along the flue, or stack, is a final self-containing fire zone supported by supplemental preheated air passing into the fire zone from a heat exchanger which is mounted on and surrounds the flue.

After retention and burning in the final fire zone, the effluent is passed to the atmosphere at an acceptable level of smoke and fly ash.

3,563,189

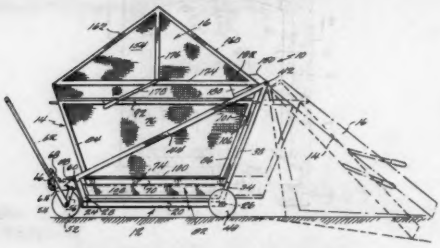
PORTABLE INCINERATOR WITH REMOVABLE REFUSE CONTAINER

Herbert S. Osburn, 4121 Custis Road, Richmond, Va.

Continuation-in-part of application Ser. No. 742,083, Apr. 17, 1967, now abandoned. This application Nov. 28, 1969, Ser. No. 878,967

Int. Cl. F23g *9/00*

U.S. Cl. 110—18 **12 Claims**



A portable incinerator with a removable wire mesh burning chamber and refuse container and a pivoting scoop for receiving refuse and discharging the refuse into the combined burning chamber and refuse container. The scoop also serves as a cover for the burning chamber.

3,563,190

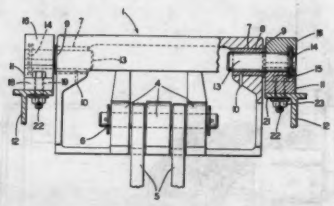
INCINERATOR STOKER GRATE AND TRUNNION ASSEMBLY

Donald J. Sprague, Massillon; Joseph F. Stenglein, Centerville, and Glenn T. Dubs, Canton, Ohio, assignors to Canton Stoker Corporation, Canton, Ohio, a corporation of Ohio

Filed Aug. 12, 1969, Ser. No. 849,942

Int. Cl. F23b *1/22*

U.S. Cl. 110—39 **9 Claims**



An incinerator stoker grate and trunnion assembly having rows of rocking grates journaled upon pillow blocks mounted upon supporting structures. Trunnion pins are clamped between the pillow blocks and their caps. Each grate has longitudinally disposed apertures in its ends and bushings located in said holes to receive the trunnion pins.

3,563,191

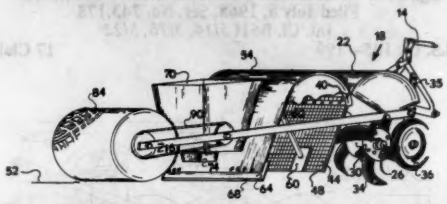
EARTH PREPARING APPARATUS

Robert L. Yovanovich, 166 Kelly St., Metuchen, N.J. 08840

Continuation-in-part of application Ser. No. 648,520, May 23, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 398,968, Sept. 24, 1964, now abandoned. This application Oct. 11, 1968, Ser. No. 768,614

Int. Cl. A01b *33/02*

U.S. Cl. 111—10 **5 Claims**



The disclosure is of earth preparing apparatus for separating rocks from soil and includes: a tiller for digging up the earth; a screen positioned behind the tiller and oriented to receive quantities of earth dug up by the tiller and to pass fine soil and reject rocks and other coarse nonsoil constituents; and a hood curved to form a large earth-receiving chamber behind the screen. The hood includes an adjustable blade at its lower edge for adjusting the level of the layer of rock-free soil. The operating stability of the apparatus with respect to maintaining a level course is controlled by the provision of a roller behind the hood whereby the apparatus can be maintained level, even though the earth over which it moves includes ruts, furrows, or other depressions. The apparatus of the invention also includes a seeder ahead of the roller for depositing seed on the rock-free layer of top soil, and it may include an auxiliary rake for removing large rocks.

3,563,192

BINDING MACHINE TRANSFER DEVICE

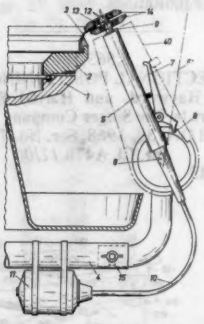
Rolf Flach, Kempten, Fritz Krause, Durach, Erhard Muller, Kempten, Hermann Fendt, and Otto Butter, Marktoberdorf, Germany, assignors to Kemptener Maschinenfabrik GmbH, Kempten, Allgau, Germany

Filed May 17, 1968, Ser. No. 730,158

Claims priority, application Germany, May 19, 1967, Sept. 27, 1967, K62318;K63468

Int. Cl. D05b *7/00;* **B23b** *25/00*

U.S. Cl. 112—26 **17 Claims**



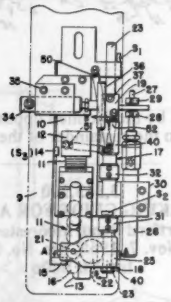
Textile material is pushed onto a rotating ring of needles at a transfer station by two pressure plates, one above and one below the needles, which are respectively moved toward and away from the needles longitudinally thereof by means of two eccentrics 180° out of phase and driven by a common shaft. The shaft may be mounted by means of an arm for pivoting movement between the transfer station and a rest position removed from the needles. Suitable controls are employed for operating the motors to drive the shaft and the ring of needles.

3,563,193

BUTTON DELIVERING DEVICE

Francis H. Hughes and Douglas J. Crawford, Troy, N.Y., assignors to Cluett, Peabody & Co., Inc., Troy, N.Y.

Filed June 27, 1969, Ser. No. 837,190
Int. Cl. D05b 3/22
U.S. Cl. 112—113 6 Claims



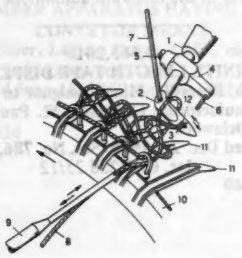
Apparatus for delivering buttons to a sewing head and during the delivery orienting the button with respect to the sewing needle. The apparatus includes a reciprocable feed carriage having means for orienting the button. Pneumatic cylinders reciprocate and tilt the carriage to feed and assist in orienting the button.

3,563,194

LOOPER FOR LINKING AND SEWING MACHINES FOR SEWING BOTH WITH SINGLE-THREAD AND TWIN-THREAD CHAINSTITCH

Cesare L. Conti, Viale Francesco Crispi 5, Milan, Italy

Filed Jan. 10, 1969, Ser. No. 790,315
Claims priority, application Italy, Jan. 22, 1968, 11821 A/68, Patent No. 823,745
Int. Cl. D05b 57/02
U.S. Cl. 112—218 3 Claims



A looper for linking and sewing machines is disclosed, in which an adjustable extension is provided, which is adapted to render the looper alternatively adapted to sewing with a single-thread chainstitch or with a twin-thread chainstitch, as desired by the machine operator, without disturbing the original adjustment of the looper.

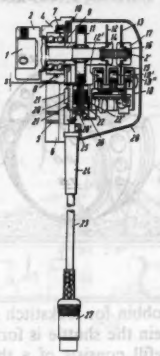
3,563,195

SEWING MACHINE DRIVE WITH POSITION CONTROL MEANS AND ROTATIONAL SPEED MEASURING GENERATOR

Alfred Heidt, Schwetzingen, Baden, Germany, assignor to Frankl & Kirchner, Fabrik fur Elektromotoren und Elektrische Apparate, Schwetzingen Baden, Germany

Filed Oct. 18, 1968, Ser. No. 768,725
Claims priority, application Germany, Mar. 21, 1968, P 17 60 008.7
Int. Cl. D05b 69/22
U.S. Cl. 112—219 9 Claims

A control assembly for a sewing machine comprising a rotational speed measuring generator and a position control means which form an assembly unit mounted on a shaft portion, which rotates with the driven shaft of the machine, where the rotor of the generator which is a multipole magnet,



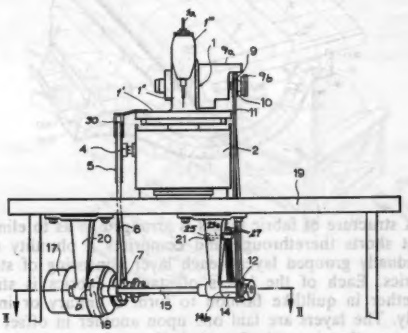
the stator and the position control means occupy very little space, and where the stationary parts are mounted on a common support which is movable or adjustable relative to the rotating parts.

3,563,196

DRIVE ARRANGEMENT FOR SEWING MACHINES

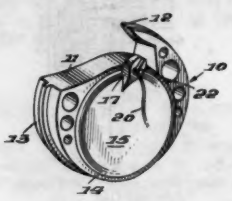
Karl Nicolay, Bielefeld, Germany, assignor to Duerkoppwerke GmbH, Bielefeld, Germany

Filed June 19, 1969, Ser. No. 834,691
Claims priority, application Germany, June 28, 1968, P 17 60 743.1
Int. Cl. D05b 69/02
U.S. Cl. 112—220 9 Claims



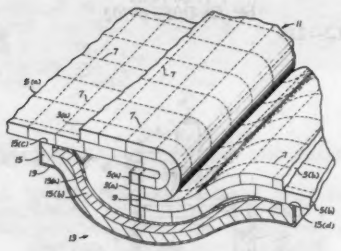
A drive arrangement for sewing machines, especially buttonhole-stitching machines, having a needle drive shaft and a stitch-former drive shaft to be independently rotated. The drive arrangement comprises an electric motor whose countershaft is provided with belt drive sheaves at axially spaced locations thereon. The countershaft is pivoted relating to the motor assembly below the fabric feed table of the machine about an axis laterally offset from the shaft axis but parallel thereto and against a spring establishing belt tension. The machine arm or head is tiltable about a horizontal axis and entrains the countershaft with it to eliminate the need for disconnecting the belts passing around the needle-drive-shaft pulley and one of the sheaves.

3,563,197
SEWING MACHINE SHUTTLE AND BOBBIN
Gerard M. Manze, Atlanta, Ga. (P.O. Box 111, Verona, Wis. 53593)
Filed Mar. 14, 1969, Ser. No. 807,367
Int. Cl. D05b *57/14*
U.S. Cl. 112—231 5 Claims



A shuttle and bobbin for lockstitch shoe sewing machines is illustrated wherein the shuttle is formed with a solid back and the bobbin refill consists of a thread package formed with no spool or metal bobbin thus materially decreasing the cost and increasing the thread capacity of the refill to provide a longer time span between refill changes.

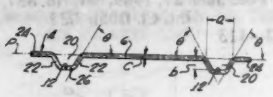
3,563,198
FABRIC FOR MICROMETEOROID PROTECTION GARMENT
Richard S. Johnston, Seabrook, Tex., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Dec. 31, 1969, Ser. No. 889,376
Int. Cl. D05b *93/00*
U.S. Cl. 112—402 3 Claims



A structure of fabric layers is arranged so as to eliminate heat shorts therethrough and comprises a plurality of individually grouped layers, each layer consisting of stacked fabrics. Each of the layers of stacked fabrics is stitched together in quiltlike fashion to form a unitary or integral body. The layers are laid one upon another in offset stitch manner, that is, with the stitch lines of each fabric being disposed intermediate the stitch line of the adjacent fabric so as to avoid a common heat transfer avenue through all layers.

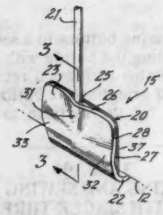
3,563,199
CAN TOP CONSTRUCTION AND METHOD OF FABRICATION
Wayne F. Wolfe, Orange, Calif., assignor to Hunt Foods and Industries, Inc., Fullerton, Calif.
Original application June 22, 1966, Ser. No. 559,511, now abandoned. Divided and this application July 15, 1968, Ser. No. 758,176
Int. Cl. B21d *51/38*
U.S. Cl. 113—121 4 Claims

A tear strip for a can top is formed by first forming a narrow groove having a central portion which defines the tear strip edge and inclined walls on the opposite sides of such central portion, and thereafter scoring the central portion of the groove to form the tear strip. The stress attendant to



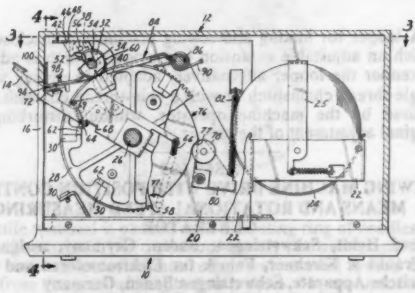
scoring is absorbed by the inclined opposite walls rather than being transmitted to the remainder of the can top metal.

3,563,200
REAR END PARKING GUIDE FOR AN AUTOMOBILE
Saul Grossman, Hartford Road, Moorestown, N.J. 08057
Filed Nov. 7, 1969, Ser. No. 874,766
Int. Cl. B60q
U.S. Cl. 116—28 6 Claims



A specifically configured clip for selective engagement with the rear or side edge of a trunk lid, and a rod to be clamped at one end by the clip for extension upward therefrom to the driver's line of sight to facilitate visual location by the driver of the rearward automobile region.

3,563,201
DEFINITE LENGTH TAPE DISPENSER
James E. Smith, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware
Filed Dec. 26, 1968, Ser. No. 786,875
Int. Cl. B23d *25/12*
U.S. Cl. 118—40 9 Claims



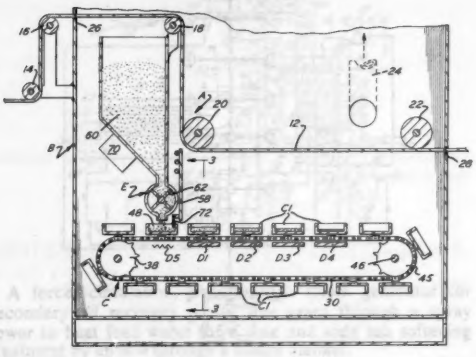
A tape dispenser in which a length of tape is advanced and severed between a pair of cylinders as the cylinders are rotated and including cam means for aiding rotation of the cylinders as the tape is severed.

3,563,202

MOBILE EVAPORATIVE FIRING SOURCE

Thomas Mackrael, Cherry Hill, N.J., and William E. Welch, Abington Township, Montgomery County, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed June 25, 1969, Ser. No. 836,334
Int. Cl. C23c *11/00*
U.S. Cl. 118—48 10 Claims



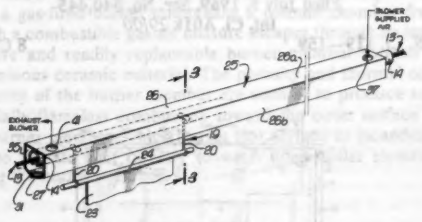
Apparatus for evaporatively coating a continuously moving strip comprising a plurality of boats which are filled with a measured quantity of evaporative material at a dispensing station and transported through a vacuum chamber in spaced disposition with the strip. The material is fired from the boats as they pass over stationary heating elements whereby a uniform coating on the substrate is achieved.

3,563,203

SPRAY CHAMBER APPARATUS HAVING PROTECTED CONVEYOR MEANS

Marshall A. Stiltner, Laguna Beach, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.

Filed June 11, 1969, Ser. No. 832,262
Int. Cl. B05c *11/16*
U.S. Cl. 118—324 10 Claims



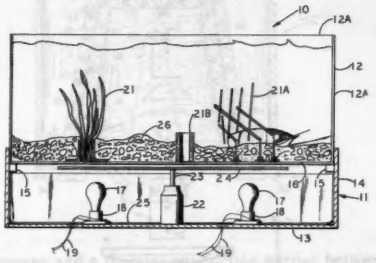
The problem of corrosive sprayed liquid or vapor-contacting conveyors carrying parts through a spray chamber is overcome by enclosing the conveyor in a duct having resilient sealing lips which are locally deflectable to pass parts supports carried by the conveyor. Entry of spray liquid and vapor into the duct past locally deflected sealing lips is positively prevented by provision of pressurized air within the duct to flow outwardly and progressively at the traveling locus of sealing lip deflection.

3,563,204

ILLUMINATED AQUARIUM

Bela A. Szilagyi, Flushing, N.Y., assignor to Belmotronics, Inc., Long Island, N.Y., a corporation of Delaware

Filed May 15, 1969, Ser. No. 824,982
Int. Cl. A01k *63/00*
U.S. Cl. 119—5 9 Claims



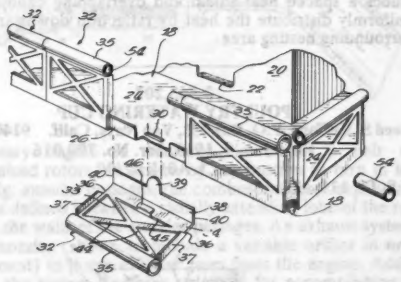
This disclosure is directed to an illuminated aquarium comprising a base for containing a hidden light source in combination with an aquarium having a translucent or light pervious bottom supported on the base. Secured to the light pervious bottom of the aquarium are optic or light transmitting means capable of internal reflection, shaped to simulate and/or to define an underwater object or theme which is indirectly illuminated by light of the hidden light source.

3,563,205

BALCONY GUARD RAIL FOR KNOCKDOWN METAL BIRDHOUSE

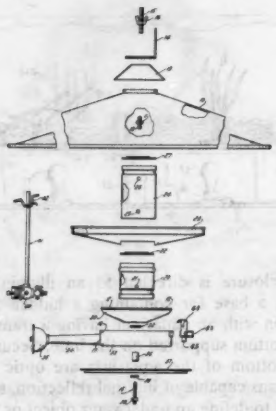
Arthur E. Vail, Griggsville, Ill., assignor to Trio Manufacturing Co., Griggsville, Ill.

Filed July 24, 1969, Ser. No. 844,463
Int. Cl. A01k *31/00, 31/12*
U.S. Cl. 119—23 5 Claims



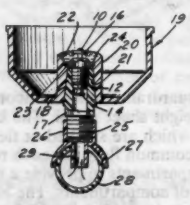
A balcony guardrail for a multicompartment birdhouse made of lightweight sheet metal. The compartments are arranged in rows which are stacked or tiered to provide multiple levels. The common floor for each row extends forwardly beyond the compartments to provide a balcony extending the length of a row of compartments. The balcony has a marginal upstanding flange its entire length and a plurality of like guardrail members are removably mounted on the flange end-to-end and releasably locked together to form a continuous guard railing along the length of the balcony. The balcony and guardrail members have cooperating slot and flange means for installing said rail members. The rail members have cooperating open-ended cylindrical formations at the upper end thereof for receiving an elongate locking rod member therein which interconnects the individual guard rail members to retain them in a continuous, rigid guardrail installation supported on the marginal flange of the balcony.

3,563,206
GAS-FIRED BURNER AND BROODER ASSEMBLY
Le Roy Nicholas Hermann, St. Charles, Ill., assignor to H. D. Hudson Manufacturing Company, Chicago, Ill., a corporation of Minnesota
Filed Mar. 6, 1969, Ser. No. 804,954
Int. Cl. A01k 31/20; F24c 3/00
U.S. Cl. 119—32 7 Claims



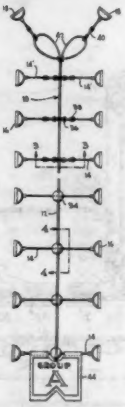
A gas-fired burner includes a lower bowl and a flared inlet conduit communicating with the interior of the bowl. An upper bowl is adapted for stacking assembly with the lower bowl and is provided with a serrated outer edge so that when the upper and lower bowls are assembled the serrated edge of the upper bowl and the inner wall of the lower bowl define a multiplicity of gas burner ports circumferentially spaced about the bowl assembly. This design substantially eliminates flashback and has turndown characteristics between about 1,000 Btu. and 30,000 Btu. The burner assembly can be included in a vertically assembled chicken brooder which includes a spaced heat shield and overlapping canopy which uniformly distribute the heat by reflection downward to the surrounding nesting area.

3,563,207
POULTRY WATERING CUP
Reed S. Kofford, P.O. Box 453, Van Nuys, Calif. 91408
Filed Jan. 9, 1969, Ser. No. 790,016
Int. Cl. A01k 07/00
U.S. Cl. 119—75 7 Claims



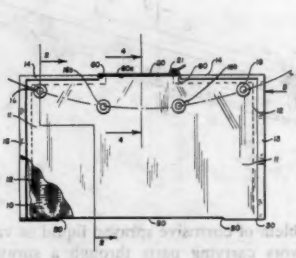
A poultry watering cup having a vertically movable valve stem normally held in an upward position by the water supply force. A cup is removably mounted on the valve assembly by frustoconical friction fit. The cup has a small well which surrounds the upper end of the valve stem. As poultry drink from the well, their beaks engage the upper end of the valve stem and depress it, causing the valve to open and refill the well.

3,563,208
SAFETY YOUTH GUIDER
Reginald A. Nero, 8 St. Charles Place, Brooklyn, N.Y. 11216
Filed July 16, 1969, Ser. No. 842,219
Int. Cl. A01k 29/00
U.S. Cl. 119—96 11 Claims



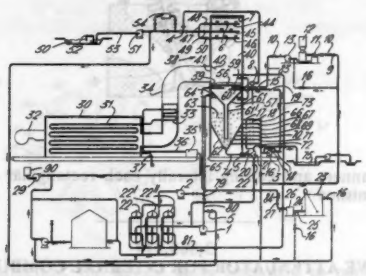
A device for maintaining walking children in an organized, supervised group is disclosed having an elongated center support member, a plurality of laterally extending crossmembers secured along the length of the center support member and handles for children to grasp secured to the distal ends of the crossmembers. At least one of the grasping handles may be utilized by an adult, preferably at the rear end of the center support member. The crossmembers are preferably constructed of weatherproof rope having metal wire reinforcement at its center to maintain the same above the ground when dropped for easy retrieval. Such members are preferably color coded for easy identification by children; the device of the present invention finding particular utility in safely conducting and keeping track of relatively large groups of young children in public.

3,563,209
ANIMAL INSECTICIDE DUST DISPENSER BAG
Richard Paul Mommer, Loveland, Colo., assignor to Balcom Chemicals, Inc., Greeley, Colo.
Filed July 9, 1969, Ser. No. 840,445
Int. Cl. A01k 29/00
U.S. Cl. 119—159 8 Claims



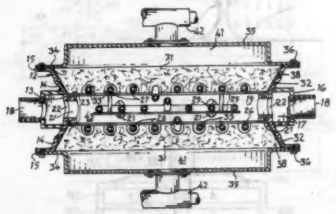
An animal insecticide dust dispenser bag having a lower sifter opening and an upper filler opening, and a plurality of grommets in arc alignment adjacent the filler opening and adapted to receive a sagging-rope-holding means therethrough and so that the sifter opening edge of the bag is held in substantially a straight line.

3,563,210
STEAM GENERATOR SYSTEM
Cornelis Hoogendam, Houston, Tex., assignor to Struthers Thermo-Flood Corporation
Filed Aug. 15, 1969, Ser. No. 850,507
Claims priority, application Great Britain, Aug. 20, 1968, 39,806/68
Int. Cl. F22b *37/48*
U.S. Cl. 122—1 6 Claims



A forced-circulation, once-through steam generator for secondary oil recovery passes flue gases through a spray tower to heat feed water for a lime and soda ash softening treatment by upflow through a sludge blanket.

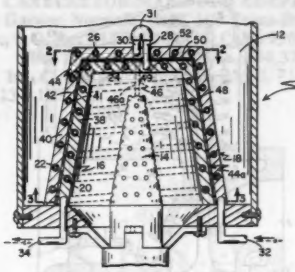
3,563,211
GAS-FIRED BOILERS OR THE LIKE
Lloyd H. Hornbostel, Jr., 1638 Emerson St., Beloit, Wis.
Filed Mar. 18, 1969, Ser. No. 808,273
Int. Cl. F22b *27/08*
U.S. Cl. 122—250 7 Claims



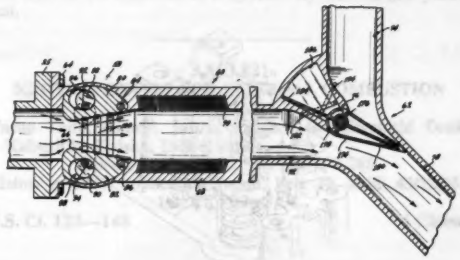
A steam boiler or analogous heat exchanger is provided with a gas-fired burner comprising a plenum chamber from which a combustible gas-air mixture escapes through an inexpensive and readily replaceable burner member formed of foraminous ceramic material. The porosity and thermal conductivity of the burner member are such as to produce substantially flameless combustion toward the outer surface of the burner member, which causes that surface to incandesce and to radiate heat directly to water-filled boiler elements facing the burner member.

3,563,212
VAPOR GENERATOR
Lawrence C. Hoagland, Concord, Mass., assignor to Steam Engine Systems Corporation, Newton, Mass.
Filed Aug. 27, 1969, Ser. No. 853,264
Int. Cl. F22b *27/08*
U.S. Cl. 122—250 13 Claims

A vapor generator utilizing heated gases to convert a feed liquid (e.g. water) to superheated vapor comprises at least two nested heat exchange members, each having a coiled tubular portion and a thermally conductive porous (e.g., brazed metal) matrix between adjacent windings of the tubing (or even surrounding the tubular portions entirely), these portions being located in series with respect to both heated gas and liquid flow in cross-counterflow arrangement, and connected in series to define a continuous tubular liquid to vapor passage and a thermal conduction barrier between the feed liquid heating zone and the vapor superheating zone of this passage, and between the matrices in the region of these zones.



3,563,213
INTERNAL COMBUSTION ENGINE EXHAUST SYSTEM
James C. Hambric, Los Angeles, Calif., assignor to K.M.F. Development Corporation
Filed June 27, 1968, Ser. No. 740,639
Int. Cl. F02b *53/06, 27/04*
U.S. Cl. 123—8.05 5 Claims

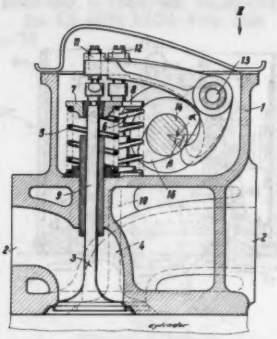


A rotary engine is disclosed, in which a pair of synchronized rotors are driven by combustion to turn in intersecting, annular passages, the combustion gases expanding in spaces defined between a radially extending lobe of the rotors and the walls of the annular passages. An exhaust system utilizes nozzles (shown to include a variable orifice in one embodiment) to purge exhaust gases from the engine. Additionally, the system discloses structure for accomplishing a continuity of exhaust gas flow, including a valved manifold whereby gases from time-displaced combustions are exhausted through a single channel.

3,563,214
INTERNAL COMBUSTION ENGINE WITH RECIPROCATORY PISTON AND CAMSHAFT ABOVE THE CYLINDER
Bernhard Medenus, Bensberg-Lustheide, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany
Filed Apr. 16, 1969, Ser. No. 816,572
Claims priority, application Germany, Apr. 28, 1968, P 17 51 208.2
Int. Cl. F01l *1/00, 3/10, 1/14*
U.S. Cl. 123—90.27 2 Claims

A reciprocatory piston-operated internal combustion engine with cylinder means having associated therewith two

valves in which the distance of one valve shank from the rocker shaft is greater than the distance of the other valve shank from the rocker shaft while that cam which actuates

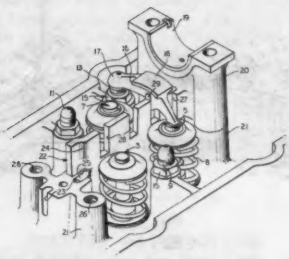


the closest valve is in the longitudinal direction of the cam shaft offset to such an extent that it is located laterally of and clears the valve spring for the respective adjacent valve.

3,563,215
ROCKER ARM GUIDE MEMBER

Gray E.D. Ross, Stock, Ingatestone, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 25, 1968, Ser. No. 778,434
Claims priority, application Great Britain, Feb. 1, 1968, 5160/68
Int. Cl. F01l *1/18*
U.S. Cl. 123—90.42 **7 Claims**



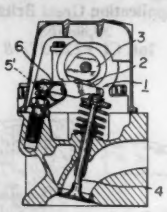
An overhead camshaft internal combustion engine cylinder has a plurality of inlet valves and an exhaust valve, the rocker arms of some of which are inclined or canted to the vertical; a plate is provided that cooperates with the rocker arm to assure that the rocker arm moves pivotally in a vertical direction.

3,563,216
ROCKER ARM FOR DRIVING POPPET VALVES OF INTERNAL COMBUSTION ENGINES

Satoshi Uemura, Tokyo, Japan, assignor to Nissan Jidosha Kabushiki Kaisha, Yokohama, Japan

Filed Aug. 2, 1968, Ser. No. 749,706
Claims priority, application Japan, Feb. 22, 1968, Sept. 18, 1967, 42-10,802;42-79,207
Int. Cl. F01l *1/18;* F16h *53/06*
U.S. Cl. 123—90.44 **6 Claims**

A rocker arm and a method for manufacturing the rocker arm, for driving poppet valves of automobile internal combustion engines of overhead cam type, which comprises a rocker arm body made of forged steel. A cast iron piece with a round top is secured to each rocker arm body for forming an arcuate contact surface with a cam driving the rocker arm. The cast iron pieces are mass produced by casting round top rectangular members, finishing the round top of the rectangular members while assembling them in a cylindri-

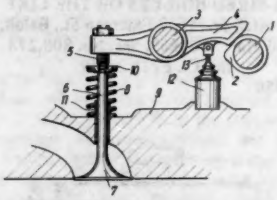


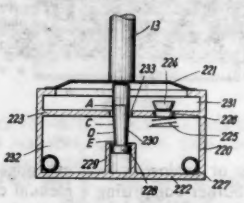
cal manner, and cutting laterally each rectangular member thus finished.

3,563,217
VALVE ATTENUATOR FOR INTERNAL COMBUSTION PISTON ENGINES

Willy Bartels, Julicher Str. 56, Dusseldorf, Germany

Filed Feb. 13, 1968, Ser. No. 705,204
Int. Cl. F01l *1/00, 1/18;* F16k *31/12*
U.S. Cl. 123—90.66 **8 Claims**





A valve control assembly for internal combustion piston engines whose rocker arm is linked to an attenuator member which member is designed in such a manner that the attenuating effect exerted thereby is decreased as the engine speed is increased so that an optimum opening movement of the valve is obtained for any speed up to maximum speed.

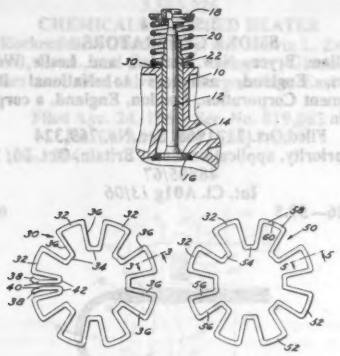
3,563,218
VALVE SPRING SPACER

Elwood L. Havens, 1060 Southfield, Lincoln Park, Mich. 48146

Filed July 7, 1969, Ser. No. 839,201
Int. Cl. F01l *3/10;* F16f *1/12*
U.S. Cl. 123—90.67 **4 Claims**

A valve spring spacer for internal combustion engines formed from a strand of metal into a circular shape with a sinuous contour. There are inner runs to locate the spacer around a valve sleeve and other runs to define the outer boundary connected by radial legs which support a valve

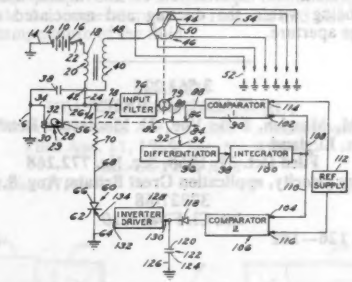
spring end away from the engine surface, thereby increasing the spring tension and permitting air flow to reduce temperature conduction, the device being fashioned to permit assembly around a valve stem without removing the stem.



3,563,219
MAXIMUM ENGINE SPEED LIMITER

Laurence F. Mieras, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 23, 1969, Ser. No. 844,123
Int. Cl. F02p *11/00*
U.S. Cl. 123—118 15 Claims

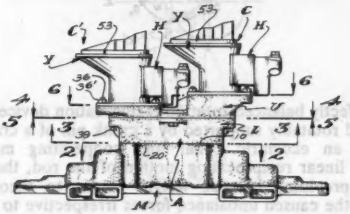


A maximum engine speed limiter for an internal combustion engine which is operative to limit the speed of the engine to some predetermined maximum. The engine speed is limited by connecting the primary winding of the ignition coil to ground by means of a limiting resistor and a solid state switching device. Circuit means are connected to the means for interrupting current through the primary winding of the ignition coil and to the solid state switching device to switch it to a conducting state when the predetermined maximum engine speed is reached. When this predetermined speed is reached, the solid state switching device becomes a substantially open circuit and current through the primary winding of the ignition coil is diverted from the circuit interrupting current through the primary winding to the limiting resistor and solid state switching device. The current is diverted to an extent that the output voltage of the secondary winding of the ignition coil is reduced to a level where the spark plugs of the internal combustion engine will not fire. The current through the current interrupting means is adequate, however, to permit adequate voltage to be developed across the means for interrupting current through the primary winding so that a speed signal from the ignition system remains available. As soon as the engine speed falls below the predetermined maximum, the circuit means switches the solid state switching device to a nonconducting state. As a result, current is no longer diverted from the means for interrupting current through the primary winding of the ignition coil and voltages sufficiently high to fire the spark plugs will again be generated in the secondary winding.

3,563,220
CARBURETOR-MANIFOLD ADAPTER

Walter L. Garner, Norwalk, Calif. (c/o Trans-Dapt of California, Inc., P.O. Box 4157, Compton, Calif. 92024)

Filed Sept. 2, 1969, Ser. No. 854,374
Int. Cl. F02m *13/06*; F02b *75/20*, *75/18*
U.S. Cl. 123—127 10 Claims

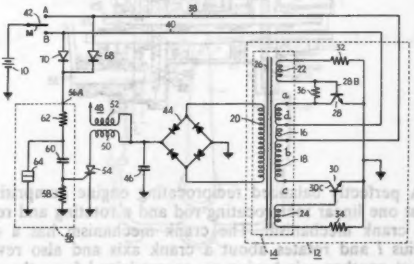


An adapter to facilitate mounting a pair of two venturi carburetors on an intake manifold designed to mount one 4 venturi carburetor, so that said pair of carburetors are arranged in close, interengaged relationship with each other, with their outlets in as close proximity to and in as close to register with the inlet of the manifold as is operatively feasible and practical.

3,563,221
IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINE

Yasuo Tada, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki, Kaisha, Tokyo, Japan

Filed Feb. 14, 1969, Ser. No. 799,260
Claims priority, application Japan, Feb. 19, 1968, 43/12,053
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 4 Claims



A low DC voltage boosted by an inverter and a rectifier charges a capacitor a charge on which is, in turn, discharged into an ignition coil under control of a thyristor. Upon starting the engine, the DC voltage is applied to an intermediate terminal of a primary transformer winding in the inverter. Diodes are connected in a circuit for gating the thyristor to prevent the circuit from partly short-circuiting the primary winding through the intermediate terminal.

3,563,222
PERFECTLY BALANCED VIBRATIONLESS ROTATION-RECIPROCATION DEVICES OF CRANKSHAFT ROTARY MOTION SYSTEM

Kenjiro Ishida, No. 22-22, 1-chome, Hirosawa-cho, Hamamatsu, Japan

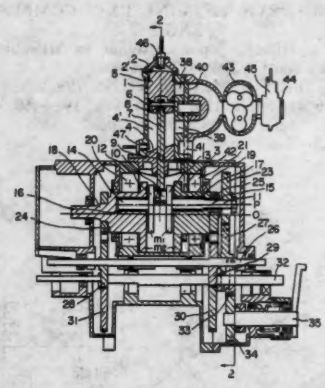
Filed July 8, 1969, Ser. No. 839,956
Claims priority, application Japan, July 16, 1968, July 16, 1968, 43/49657;43/49658
Int. Cl. F02b *75/06, 75/32*
U.S. Cl. 123—192 4 Claims

A perfectly balanced rotation-reciprocation device providing a rod rotatably supported by a crank pin of a crankshaft through an eccentric collar and cooperating means to produce linear reciprocating motion of the rod, the device further providing balance weight means to theoretically balance the caused unbalance forces irrespective to the fact that the balance weights are secured asymmetrically to the longitudinal axis of the rod.

3,563,223
PERFECTLY BALANCED DOUBLE-ACTING RECIPROCATING MACHINE

Kenjiro Ishida, Hamamatsu, Japan, assignor to President Shizuoka University

Filed Jan. 15, 1969, Ser. No. 791,327
Claims priority, application Japan, Jan. 30, 1968, 43/5,636;43/5,637
Int. Cl. F02b *75/06, 75/22, 25/08*
U.S. Cl. 123—192 9 Claims

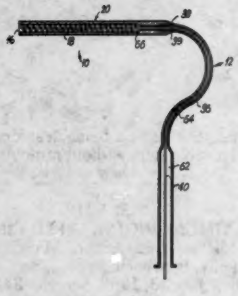


A perfectly balanced reciprocating engine comprising at least one linear reciprocating rod and a rotating and revolving crank mechanism. The crank mechanism has a crank radius l and rotates about a crank axis and also revolves about another axis having an eccentricity-l from the crank axis in the opposite direction of crankshaft rotation to effect a linear reciprocating motion with a stroke $4l$. The crank mechanism further comprises a balance weight of mass positioned m_1 at the opposite side of the crank pin and at a distance R_1 from the crank and also another balance weight of mass m_2 secured to a rotatably mounted eccentric collar to effect revolution of the crank directly in the opposite side of the crankshaft positioned at a distance R_2 from the crank axis. Both balance weights are determined to satisfy the formulae $ml=m_1R_1$ and $(m+m_1=m_2)l=m_2R_2$ wherein, m is the reciprocating mass, m_2 is the total rotating mass except for the masses m_1 and m_2 and l is the crank radius. The engine according to the invention provides a perfectly balanced operation.

3,563,224
SMOKE GENERATORS

Denis William Bryer, New Malden, and Leslie Woodgate, Hampton, England, assignors to National Research Development Corporation, London, England, a corporation of Britain

Filed Oct. 21, 1968, Ser. No. 769,324
Claims priority, application Great Britain, Oct. 26, 1967, 48805/67
Int. Cl. A01g *13/06*
U.S. Cl. 126—59.5 6 Claims

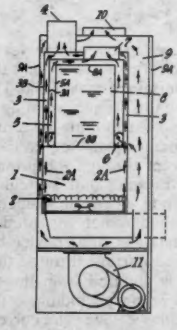


A smoke generator including ducting for connecting a supply of smoke producing liquid to a discharge aperture and heating means for vaporization of said liquid, the heating means being within the ducting and associated with the discharge aperture.

3,563,225
WARM AIR UNITS

Mario M. Masrieh, Belle Vue, 21 Montacute Road, Lewes, Sussex, England

Filed Oct. 31, 1968, Ser. No. 772,268
Claims priority, application Great Britain, Aug. 8, 1968, 37827/68
Int. Cl. F24d *5/10*
U.S. Cl. 126—101 4 Claims



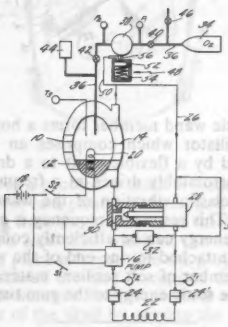
A warm air producing unit in which an airflow chamber and a tank for the bulk storage of liquid are both heated by a common combustion chamber is characterized in that part of the surface area of the tank is exposed directly to the heat generated in the combustion chamber so that the water in the tank may be heated, and part of the surface area of the tank is swept over by at least some of the airflow in the airflow chamber, the ratio of the two areas being such that when the combustion gases have heated the water in the tank to a

predetermined temperature the heat loss from the contents of the tank to said airflow is sufficient to prevent said predetermined temperature from being exceeded.

3,563,226
CHEMICALLY FUELED HEATER

John D. Rockenfeller, Glastonbury, and Melvin L. Zwillenberg, Hartford, Conn., and Calvin A. Gongwer, Glendora, Calif., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 24, 1969, Ser. No. 819,062
Int. Cl. A61f 7/06; F24j 1/00
U.S. Cl. 126—204 25 Claims

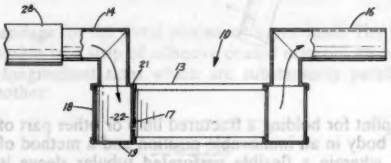


A chemically fueled heater is disclosed in which gaseous oxygen is combined with phosphorus in a reactor to generate heat for heating a fluid circulated in the reactor. The heated fluid is circulated into a heating coil or other object to be heated. Automatic controls are provided for the oxygen flow to regulate the temperature of the reaction and also to regulate the temperature of the fluid.

3,563,227
HEAT TRANSFER ASSEMBLY

Lewis L. Ruter, 218 26th Ave. N., Apt. 7, Minneapolis, Minn.

Filed Apr. 11, 1969, Ser. No. 815,448
Int. Cl. F24h 1/06
U.S. Cl. 126—271.1 6 Claims



A heat transfer member having an annular chamber connectable to a source of heated fluid, as the exhaust of an internal combustion engine, for changing the temperature of an environment surrounding the heat transfer member. The heat transfer member has a tubular circular shape with an inlet on one side of the member and an outlet on the opposite side of the member.

3,563,228
PROCESS OF FORMING ADHERENT FILMS ON ANIMAL TISSUE

Maurice Seiderman, 3306 Derondo Drive, Hollywood, Calif. 90028

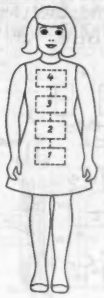
Filed Feb. 28, 1969, Ser. No. 803,421
Int. Cl. A61b 19/00
U.S. Cl. 128—1 6 Claims

Animal tissue, such as bruised skin, skin graft removal sites, corneas, and the like are coated with a protective layer of undenatured collagen by electrophoretic migration of collagen particles from a suspension thereof in contact with the tissue. The layer thus formed is adherent, and in general becomes a part of the animal treated.

3,563,229
CARDIAC SOUND SIMULATOR

Erling Olav Valdemar Petrusson, Uppsala, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 25, 1967, Ser. No. 678,107
Claims priority, application Sweden, Oct. 27, 1966, 14,742/66
Int. Cl. A61b 19/00
U.S. Cl. 128—1 3 Claims

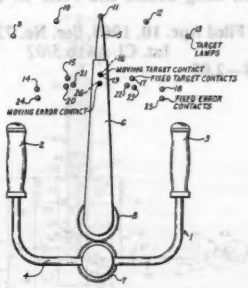


Incorporated within a toy is a cardiac sound simulator. The simulator comprises a pulse generator which generates pulses in pairs. The time between the pulses in each pair being less than the time between pairs and the two pulses of a pair having different time durations. The pulses are fed to a loudspeaker which converts the pulses to a sound having the rhythm of a heartbeat.

3,563,230
APPARATUS FOR TESTING A SUBJECT

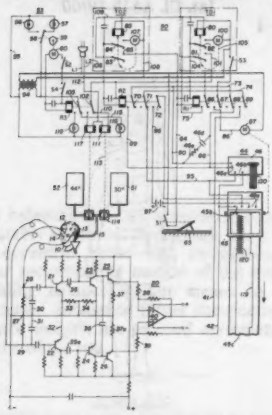
Charles B. Gibbs, Province Ottawa, Canada, and Gladys A. Gibbs, Executrix

Filed May 13, 1968, Ser. No. 728,626
Claims priority, application Canada, May 16, 1967, 990609
Int. Cl. A61b 5/16
U.S. Cl. 128—2 8 Claims



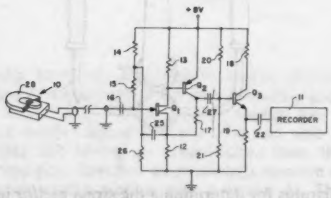
An apparatus for determining the stress and/or impairment of a test subject by providing a plurality of lamps which are illuminated in sequence, the test subject being required to operate a handle to align a pointer with the lamps as they become illuminated. The responses of the test subject, including his response time, are measured by way of electrical circuits so as to determine particular characteristics of the test subject whereby an indication can be obtained as to his stressed condition or impairment.

3,563,231
ELECTRONYSTAGMOGRAPH CONTROL SYSTEM
Behrman A. Ducote, Richardson, and Lawrence V. Nicastro, Irving, Tex., assignors to Tracor Inc., Austin, Tex.
Continuation of Ser. No. 586,508, Oct. 13, 1966. This application Feb. 19, 1969. Ser. No. 802,753
Int. Cl. A61b 5/10
U.S. Cl. 128—2.1 5 Claims



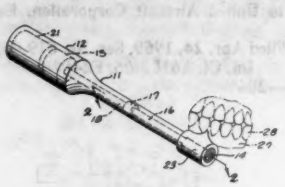
An electronystagmograph including a system for irrigating the subject's ear with hot or cold water to cause nystagmus, sensors for measuring the potential in the vicinity of the subject's eyes, 2-channel recording means, and a timing system for controlling a valve in the water supply for establishing the irrigation interval and energizing one recording channel to record the duration of the irrigation interval and, at the end of the irrigation interval, to energize the second channel to record the potential detected by the sensors during a subsequent measuring interval.

3,563,232
VIBROPHONOCARDIOGRAPH
James Webb, Administrator of the National Aeronautics and Space Administration with respect to an invention of Lester N. Wright, Long Beach, and Peter R. Barker, Lawndale, Calif.
Filed Apr. 10, 1968, Ser. No. 720,041
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 3 Claims



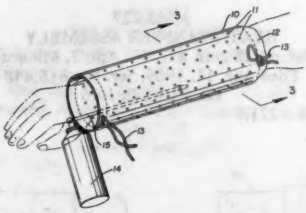
Apparatus is disclosed for monitoring cardiac dynamics comprising an extremely low weight and small volume piezoelectric microphone with an amplifier having high input impedance for high sensitivity and low frequency response in a dynamic range of from about 2 to 2,000 cycles per second.

3,563,233
SONIC DENTAL TOOL FOR MASSAGING GUMS
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406
Filed Mar. 17, 1969, Ser. No. 807,866
Int. Cl. A61h 1/00
U.S. Cl. 128—36 8 Claims



A hollow elastic wand member forms a housing for an orbiting mass oscillator which comprises an eccentric rotor which is coupled by a flexible shaft to a drive motor. The rotor member is rotatably driven at a frequency such as to cause resonant elastic vibration of the wand in a gyratory vibration mode. This resonant frequency is chosen so that it is one at which energy can be efficiently coupled to gum tissue. Removably attached to one end of the wand member is an applicator member of soft resilient material which is utilized to couple the sonic energy to the gum tissue.

3,563,234
SPLINT
Donald E. Umstead, 24 W. Manor Ave., Youngstown, Ohio 44514
Filed Aug. 21, 1968, Ser. No. 754,367
Int. Cl. A61f 5/04
U.S. Cl. 128—90 4 Claims

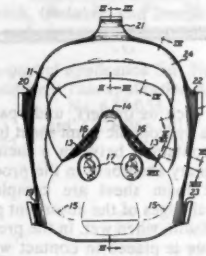


A splint for holding a fractured limb or other part of a patients body in an immovable position and a method of making it wherein a flexible perforated tubular sleeve is positioned about the limb to be immobilized, both of the ends secured to the limb to form closures and a foamable fluent self-hardening material used to fill the area about the limb and within the confines of the perforated sleeve to form a rigid lightweight structure about said limb.

3,563,235
INTRAUTERINE CONTRACEPTIVE METHOD
Jaime A. Zipper, Santiago, Chile, assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed Sept. 18, 1968, Ser. No. 760,688
Int. Cl. A61f 5/46
U.S. Cl. 128—130 8 Claims

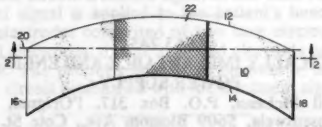
A method of contraception is disclosed characterized by providing for the presence of elemental copper or zinc in the uterine cavity. This invention is preferably practiced by wrapping a small amount of wire or foil or by placing a sleeve around a conventional intrauterine device prior to implantation. In a modification of this method, two different metals are employed to provide improved effectiveness.

3,563,236
FACE PIECES FOR PROTECTIVE MASKS
Otto Henry Hansson, Beddingestrand, Sweden, assignor to Trelleborgs Gummifabriks Aktiebolag, Trelleborg, Sweden
Filed Nov. 20, 1968, Ser. No. 791,830
Claims priority, application Sweden, Feb. 15, 1968, 1979/68
Int. Cl. A61f *9/06*
U.S. Cl. 128—141 **6 Claims**



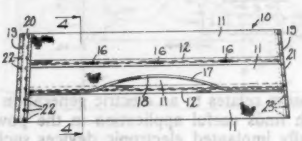
A face piece for a protective mask is made from a natural or synthetic rubber or a plastic material and has a solid sealing rib projecting from the inner side of the face piece to engage the wearer's face. The width of the sealing rib in the plane of the face piece is larger than the projection of the rib from the inner side of the face piece, and the surface of the rib engaging the wearer's face is profiled to approximately follow the shape of the skull by varying the thickness of the rib longitudinally and transversally thereof.

3,563,237
DISTAL PHALANX BANDAGE
Edwin L. Maxwell, 833 6th St. SW., Washington, D.C.
Filed Nov. 6, 1968, Ser. No. 773,718
Int. Cl. A61f
U.S. Cl. 128—157 **6 Claims**



A bandage for the distal phalanxes is provided. The bandage consists of a strip of adhesive coated material having arcuate longitudinal sides which are substantially parallel to one another.

3,563,238
ELASTIC BINDER
Thomas J. McGuire, South Royalton, Vt., assignor to The Berger Brothers Company, New Haven, Conn.
Filed Dec. 24, 1968, Ser. No. 786,578
Int. Cl. A61f
U.S. Cl. 128—157 **13 Claims**

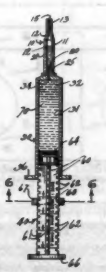


An elastic binder for applying support to parts of the body which are damaged or wounded, comprising a plurality of elastic strips which are elastic along their length and substantially inelastic along their width. The adjacent lengthwise edges of each pair of elastic strips are secured together to form a set of at least two combined strips. The combined strips are overlapped along their lengthwise edges and the free lengthwise edges of one combined strip is stitched at measured intervals to the other combined strip which overlaps it. Means are secured at the ends of the combined strips for fastening the strips together in a body-encircling manner.

3,563,239
HYPODERMIC INJECTOR
Clifford W. Hill, Mountainside, N.J. (8 Summit Place, Pleasantville, N.Y. 10570)
Continuation-in-part of application Ser. No. 503,874, Oct. 23, 1965, now Patent No. 3,399,675, dated Sept. 3, 1968. This application June 4, 1968, Ser. No. 734,344
Int. Cl. A61m *5/18;* **A61b** *17/36*
U.S. Cl. 128—215 **1 Claim**

Chilling device for a hypodermic needle comprising a casing of heat absorptive material having sufficiently thick walls to be refrigerated and thereby act as a pain killer for the injections.

3,563,240
DUAL UNIT SYRINGE
Jules Silver, North Franklin, Conn. 06254
Filed July 20, 1966, Ser. No. 566,688
Int. Cl. A61m *3/00*
U.S. Cl. 128—234 **1 Claim**

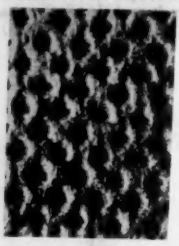


A dual unit syringe capable of supporting a plurality of isolated medicaments or pharmaceuticals separated one from the other under such circumstances that they will be maintained in stable form for long shelf life. The syringe has means using one liquid medicament and a cannula containing another and different liquid medicament under such circumstances that the medicaments can be mixed in and expelled from the cannula in blended form.

3,563,241
WATER-DISPERSIBLE NONWOVEN FABRIC

Franklin James Evans, Wilmington, Del., and Charles Shambelan, Chattanooga, Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 693,757, Oct. 6, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 660,411, Aug. 15, 1967, now abandoned, continuation-in-part of application Ser. No. 594,024, Nov. 14, 1966, now abandoned, continuation-in-part of application Ser. No. 486,502, Sept. 10, 1965, now abandoned. This application Nov. 14, 1968, Ser. No. 775,767
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 38 Claims

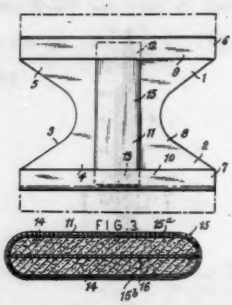


A soft, water-dispersible, nonwoven fabric of fibers secured in place by random fiber entanglement with at least 10 percent of the fibers chemically modified to have a surface that becomes slippery when wet with water to promote water-dispersibility. Processes for producing the above entangled fabrics which include both fiber modification to the water-sensitive form prior to fiber entanglement and subsequent to fiber entanglement are also disclosed.

3,563,242
DIAPER

Bengt Hedstrom, Inspectorbacken 59, Vallingby, and Ebbe Hoden, St. Eriksgatan 67, Stockholm, Sweden

Filed Jan. 25, 1968, Ser. No. 700,576
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 2 Claims

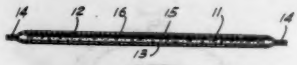


A diaper including a thin and flexible, plastic back sheet or swaddle, which is contoured and dimensioned to enable the person handling the infant to adjust it about the infant without separate fastening means, and in which an absorbent pad is removably inserted. The pad comprises one or more covering sheets enclosing wadding having a barrier sheet of liquid-resistant material for enhancing the uniform distribution of fluid through the wadding.

3,563,243
ABSORBENT PAD

Julius A. Lindquist, Somerville, N.J., assignor to Johnson & Johnson, a corporation of New Jersey

Filed Jan. 19, 1968, Ser. No. 699,096
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 8 Claims



Absorbent pads, such as diapers, underpads and the like are made in which a hydrophilic foam sheet formed of hydrophilic polymer is contained between a facing and backing and acts as the primary absorbent in the product. The edges of the hydrophilic foam sheet are completely contained within the peripheral edges of the absorbent pad and secured against lateral extension, when wet. In the preferred structure crepe cellulose tissue is placed in contact with a surface of the hydrophilic foam sheet with the creping of the tissue, particularly where the absorbent pad is for use as a diaper, running lengthwise of the diaper.

3,563,244
CONDOMS

Kunitami Asaka, Tokyo, and Masao Mori, Ichinomiya-shi, Japan, assignors to Hajime Moribe, Tokyo, Japan and Shinataro Ide, Hyogo-ken, Japan

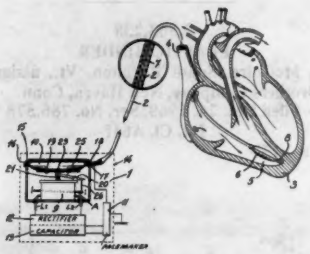
No Drawing. Filed Mar. 15, 1968, Ser. No. 713,293
Int. Cl. A61f *5/42*
U.S. Cl. 128—294 10 Claims

A condom, the film of which consists of a bland of a synthetic resinous substance such as saponified polyvinyl alcohol and a rubber latex, said condom being capable of keeping its physical configuration when brought into contact with warm aqueous liquid having a temperature substantially same as that of a human body, yet capable of being decomposed when kept into contact with cold water and after lapse of a certain time period.

3,563,245
BIOLOGICALLY IMPLANTABLE AND ENERGIZED POWER SUPPLY

Donald Neil McLean, P.O. Box 317, l'Orignal, Ontario; Jacob Rosenswelg, 5609 Blossom Ave., Cote St. Luc 29, Quebec, Canada; and John Saunders, 113 Arnold Drive, East Hartford, Conn.

Filed Mar. 15, 1968, Ser. No. 713,400
Int. Cl. A61n *1/00*
U.S. Cl. 128—419 6 Claims



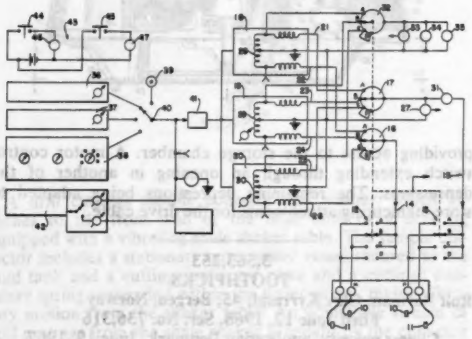
The disclosure relates to an electric generation system or device which finds useful application in the power supply units of totally implanted electronic devices such as heart pacemakers; it is particularly intended as an advantageous alternative to limited duration implantable power supplies generally used. The resulting novel power supply unit utilizes fluid pressure transfer means for tapping a small fraction of the energy derived from the muscular contractions of the

heart and transmitting same to a remotely implanted generator wherein the tapped energy is converted to electrical energy.

3,563,246
METHOD AND APPARATUS FOR IMPROVING NEURAL PERFORMANCE IN HUMAN SUBJECTS BY ELECTROTHERAPY

Henry K. Puharich, Ossining, and Joseph L. Lawrence, New York, N.Y., assignors to Intelectron Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 446,267, Apr. 7, 1965, now abandoned. This application Apr. 24, 1967, Ser. No. 633,035
Int. Cl. H05g *1/00*
U.S. Cl. 128—422 13 Claims

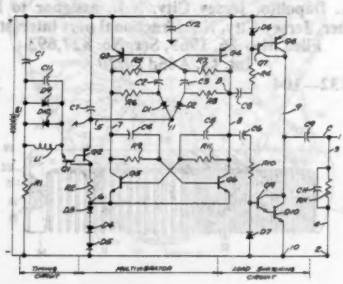


A method of patient rehabilitation by electrotherapy including periodically electrically stimulating the patient in the region of his facial nerve system by a controlled alternating electrical treatment signal, which signal is an amplitude modulated, double sideband signal of less than 100 kHz. The treatment signal is applied to the patient's head through a pair of electrodes comprised of two bare electrodes or two insulated electrodes, or one insulated electrode and one bare electrode. The patient's head is an element in an LC series resonant circuit established with the treatment signal source.

3,563,247
BIDIRECTIONAL HEART STIMULATOR

David L. Bowers, Wauwatosa, Wis., assignor to General Electric Company

Filed Mar. 14, 1968, Ser. No. 713,110
Int. Cl. A61h *31/00*
U.S. Cl. 128—422 2 Claims



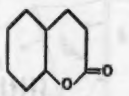
An implantable electronic heart stimulator has a coupling capacitor in series with the subject's heart to which it is electrically connected. Electronic switches sequentially apply a pulse of one polarity for stimulating the heart by charging the capacitor and apply a second stimulating pulse of opposite polarity by discharging the capacitor. An electronic timer controls the electronic switches. Means are provided for increasing the pulse repetition rate externally of the subject.

3,563,248
TOBACCO PRODUCT

Tilford F. Riehl, Jr., and John E. Kennedy, Jr., Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed May 16, 1969, Ser. No. 825,421
Int. Cl. A24b *15/04*
U.S. Cl. 131—17 3 Claims

A tobacco product is described which includes a 3-(2-hydroxycyclohexyl) propionic acid, delta lactone having the structure

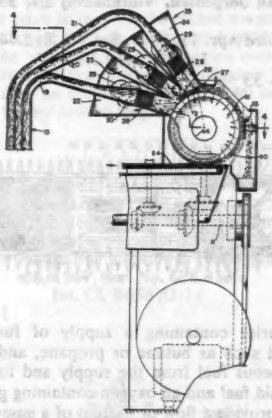


Small amounts of this lactone enhance the flavor and aroma of the tobacco and improve the organoleptic qualities of the tobacco smoke.

3,563,249
METHOD AND APPARATUS FOR MANUFACTURING CONTINUOUS STRANDS OF A POURABLE MATERIAL SUCH AS SHREDDED TOBACCO

Herbert Geyer and Johannes Herrmann, Dresden, Germany, assignors to VEB Tabak-und Industriemaschinen, Dresden, Germany

Filed July 19, 1968, Ser. No. 746,152
Int. Cl. A24c *5/18*
U.S. Cl. 131—84 5 Claims



A method and apparatus for continuously manufacturing a strand of fibrous pourable material, such as shredded tobacco. A tobacco feeding arrangement delivers the material initially into the inlet end of an elongated suction conduit in which the stream of fibrous material is divided into subsidiary streams and delivered to a transfer location from where the material flows into engagement with the perforated peripheral wall of a rotary suction wheel. The initial suction stream terminates at this transfer location, while a second suction stream is applied through the suction wheel to draw the material against the periphery thereof. The several subsidiary suction conduits have a direction of flow which cuts across the periphery of the suction wheel at a predetermined angle providing for movement-free, layered deposition of the several subsidiary streams onto the periphery of the suction wheel with the several streams being distributed one behind the other along the periphery of the suction wheel. The cross

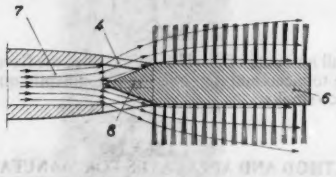
section of each of the several subsidiary suction conduits gradually diminishes to the width of the suction wheel while each subsidiary conduit has a circumferential length several times greater than its minimum width.

3,563,250

DEVICE FOR THE EVACUATION OF AIR FOR APPARATUS OF THE TYPE OF BRUSH OR COMB WITH BELLOWS

Phillippe DeFalandre, 17 Boulevard de la Republique, Versailles 78, France

Filed July 11, 1968, Ser. No. 743,989
Claims priority, application France, July 12, 1967, 714154
Int. Cl. A45d *24/00*
U.S. Cl. 132—11 **6 Claims**



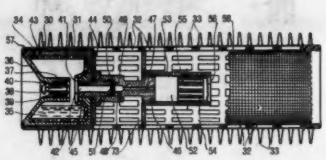
The present invention relates to a device for apparatus of the type of comb or brush with bellows permitting it to send at least a part of the air pulsed parallel to the axis of the comb or of the brush and outside of their body.

3,563,251

HAIR CURLER

Niels Christian Jorgensen, Vinrankevej 19, 2900 Hellerup, Denmark

Filed Apr. 11, 1969, Ser. No. 815,443
Int. Cl. A45d *2/12*
U.S. Cl. 132—33 **24 Claims**



A hair curler containing a supply of fuel, preferably liquefied fuel such as butane or propane, and a nozzle for releasing gaseous fuel from the supply and for providing a mixture of said fuel and an oxygen containing gas, preferably air, so as to provide a flow or current of a gaseous combustible fuel mixture, which is directed to an area within the hair curler where the fuel of the mixture is oxidated or burned in the presence of an oxidation catalyzing material whereby heat is generated within the curler.

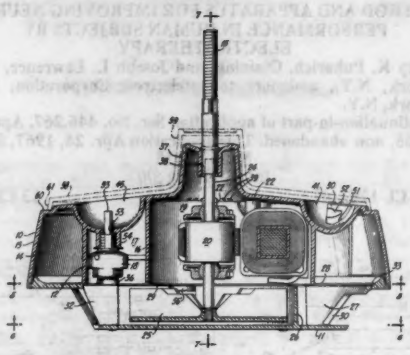
3,563,252

MANICURE DEVICE

Albert R. Spohr, Park Ridge, and Frank J. Di Sesa, Jr., Lombard, Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Continuation of application Ser. No. 536,087, Mar. 21, 1966, now abandoned. This application Oct. 21, 1968, Ser. No. 779,294
Int. Cl. A45d *29/05*
U.S. Cl. 132—73.6 **15 Claims**

A motor operated manicure device comprising a housing having a central opening and a plurality of spaced depressions formed in its top. A flexible drive cable-to-motor coupler mounted in said central opening and secured to the output shaft of a motor mounted inside the housing. A wall surrounding said motor and spaced from the periphery of the housing to define a chamber for storing the flexible drive cable. An opening being formed in one of the depressions for



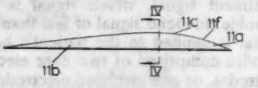
providing access to the storage chamber. A motor control switch extending through an opening in another of the depressions. The remaining depressions being adapted to store manicuring attachments for the drive cable.

3,563,253

TOOTHPICKS

Rolf Barman, Olav Kyrresgt. 45, Bergen, Norway

Filed June 12, 1968, Ser. No. 736,316
Claims priority, application Denmark, June 19, 1967, 3,167/67
Int. Cl. A61c *15/00*
U.S. Cl. 132—89 **9 Claims**



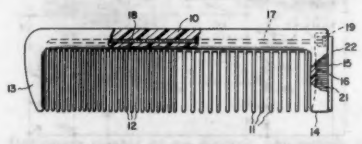
A toothpick of essentially triangular cross section and tapered at both ends, one or both of the apex edge and base face thereof having an outwardly curved contour. A process for manufacturing said toothpicks involving forming V-shaped grooves of the requisite shape in a raw material and separating the toothpicks therefrom.

3,563,254

COMBINATION COMB AND NAIL TREATMENT DEVICE

August A. Dapolito, Jersey City, N.J., assignor to Mary A. Gallagher, Jersey City, N.J., fractional part interest to each

Filed May 26, 1969, Ser. No. 827,693
Int. Cl. A45d *24/20*
U.S. Cl. 132—104 **3 Claims**



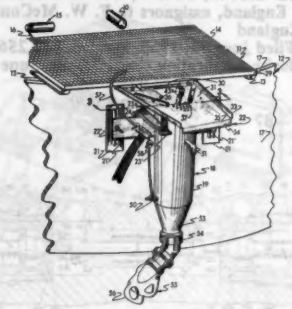
A comb for the hair having a self-contained nail filing and brushing attachment which is easily withdrawn and separated from the comb during use and which is housed substantially entirely within the comb during periods of nonuse without interfering with the normal usage of the comb.

3,563,255

APPARATUS FOR COLLECTING AND WASHING WELL CUTTINGS

Royden Barnard Morris, 520 Brunswick Ave. SW., Calgary, 6, Alberta, Canada

Filed Dec. 27, 1968, Ser. No. 787,363
Int. Cl. B08b *3/04*
U.S. Cl. 134—133 20 Claims



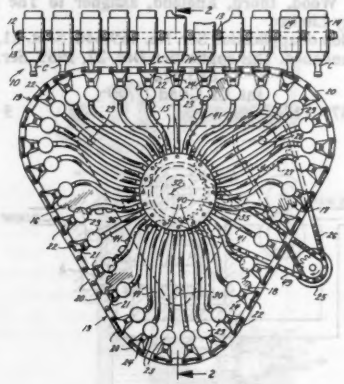
A drill cuttings sample collector and washer, which attaches to the front wall of the mud tank of a drill rig equipped with a vibrating shale shaker table. The sample collector includes a stationary outer water vessel secured to the mud tank and a cuttings collector plate and a cuttings container spring-suspended within the water vessel, taking vibratory motion from the shaker table. An adjustable stream of drill cuttings from the shale shaker is caught by the collector plate and discharged into the vibrating cuttings container, the cuttings falling downwardly over a series of baffles where washing action takes place to remove the mud from the cuttings. The washed cuttings are caught at the bottom of the water vessel and periodically removed for examination.

3,563,256

CONTAINER RINSING AND TREATING APPARATUS

Momir Babunovic, Des Peres, Mo., assignor to Barry-Wehmiller Company, St. Louis, Mo.

Filed Feb. 3, 1969, Ser. No. 795,867
Int. Cl. B08b *3/02*; B67c *1/00*
U.S. Cl. 134—144 7 Claims



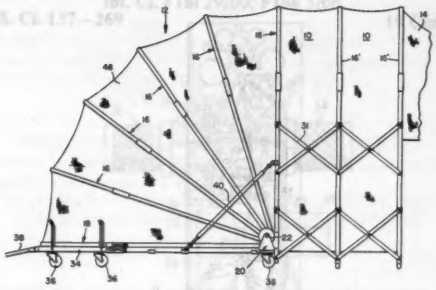
Apparatus for rinsing and treating containers prior to filling in which the containers are brought to the zone of rinsing in single file or in multiple files, a continuously moving conveyor of nozzles is provided with alignment means engageable with the neck or crown ring of the container filling mouth to align the nozzles, and valved means controlling the supply of rinsing and treating fluid is connected by flexible conduits to the nozzles for injecting the fluid during the period of travel together of the containers and the alignment means.

3,563,257

COLLAPSIBLE AND PORTABLE AIRCRAFT NOSE DOCK

Phil F. Cummins, Fort Worth, Tex., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Oct. 21, 1968, Ser. No. 768,987
Int. Cl. E04b *1/347*
U.S. Cl. 135—4 1 Claim



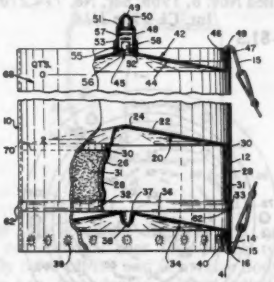
A collapsible and portable shelter for the nose of an aircraft including a toroidal section supported on U-shaped bows, the outer ends of which are pivoted for an erecting and collapsing action basically similar to the action of a perambulator hood. The legs of the bows are hinged near the bight portions of the bows so they can be folded inwardly when the structure is collapsed to form a compact bundle. The bow at one end of the structure is mounted on casters for easy maneuverability when the structure is collapsed. Straight vertical sections may be secured to the toroidal section to extend the dock to any desired length.

3,563,258

DISPOSABLE HERMETICALLY SEALED CONTAINER AND METHOD

Valentine Hechler, IV, 26 Meadow View Lane, Northfield, Ill.

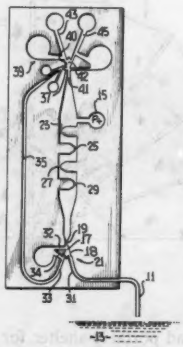
Continuation-in-part of application Ser. No. 545,007, Apr. 25, 1966, now Patent No. 3,431,941. This application Oct. 26, 1967, Ser. No. 678,313
Int. Cl. B65d *83/14*
U.S. Cl. 137—1 24 Claims



A one-time use container for intermittently dispensing and storing chemicals out of contact with the air in which a container having a one way movable bottom or follower member is subjected to a suction for the eduction of stored fluid contents through a backflow check valve. The movable bottom slidably engages a cylindrical wall of a container under a sliding interface contact ranging from a close clearance fric-

tional fit to an interference fit providing a radial displacement pressure strong enough to progressively expand the container wall as it moves. The interface contacting area is sealed against leakage of liquid and gases, and preferably lubricated, by a highly viscous fluid that is chemically inert to the liquid contents.

3,563,259
FLUIDIC LIQUID LEVEL SENSOR
Donnie R. Jones, Silver Spring, Md., assignor to Bowles Engineering Corporation, Silver Spring, Md.
Filed Mar. 15, 1968, Ser. No. 713,480
Int. Cl. F15c 1/12
U.S. Cl. 137—1 **18 Claims**

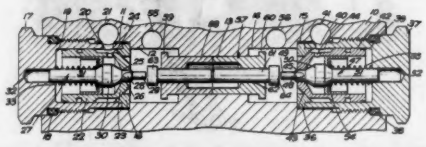


A fluidic liquid level sensor comprising a fluidic switching element which issues a stream of fluid from a first output passage through a sensor tube unless the sensor tube is blocked by the liquid level being sensed, in which case the stream of fluid issues through a second output passage. The second output passage is connected to the control nozzle of a monostable fluidic logic element, the latter providing a fluid output signal at either of two output passages as a function of the presence or absence of fluid at the control nozzle. The pressure of the stream of fluid issued to the sensor tube is maintained relatively low so as to prevent bubbling and perturbations in the liquid level being sensed as would otherwise be caused by high pressure fluid issuing from the sensor tube.

3,563,260
POWER TRANSMISSION
Gaylord O. Ellis, Rochester, Mich., assignor to Sperry Rand Corporation, Troy, Mich., a corporation of Delaware
Filed Nov. 8, 1968, Ser. No. 774,270
Int. Cl. F15c 1/16
U.S. Cl. 137—81.5 **11 Claims**

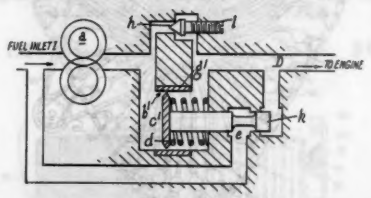
A vortex flow control device having a chamber with a main stream input flowing radially inward during one mode of operation and flowing in a logarithmic spiral path during a second mode of operation for creating a back pressure for a metering element which is inversely proportional to the flow rate of the fluid issuing from said metering element.

3,563,261
LOCKOUT VALVE ASSEMBLIES FOR HYDRAULIC CONTROL SYSTEMS
Willard Denis Griffith, Ludlow, and Paul Gerrard Bottrell, Adforton, England, assignors to F. W. McConnel Limited, Ludlow, England
Filed June 11, 1969, Ser. No. 832,256
Claims priority, application Great Britain, June 12, 1968, 27,975
Int. Cl. F15b 15/00
U.S. Cl. 137—87 **12 Claims**



A lockout valve assembly comprises first and second nonreturn valves, arranged to permit flow from a hydraulic control valve to the two sides respectively of a double-acting hydraulic ram. Each nonreturn valve comprises a chamber for communication with a service port of the hydraulic control valve, a movable main valve member engageable with a valve seat surrounding an outlet for communication with one side of the double-acting device, and a pilot valve member engageable with a pilot port in the main valve member, there being provided between the first and second nonreturn valves a reciprocable plunger assembly having one end thereof projecting into each valve chamber and arranged, when moved further into the chamber, to engage and move the pilot valve member in a manner to permit flow of hydraulic fluid through the pilot port. There is movable with each valve member a piston part reciprocable within a bore closed at one end there being a restricted passage through which hydraulic fluid can escape as the piston part moves towards the closed end of the bore and through which fluid must pass to enter the bore and cause closure of the pilot valve.

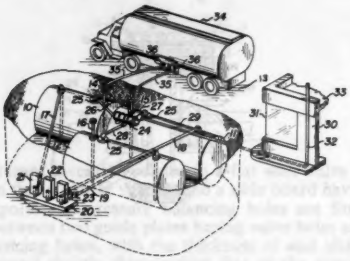
3,563,262
HYDRAULIC SPEED GOVERNORS
Robert S. Wood, Ilford, England, assignor to The Plessey Company Limited
Continuation of application Ser. No. 669,646, Sept. 21, 1967, now abandoned. This application Dec. 22, 1969, Ser. No. 883,672
Int. Cl. G05d 27/00
U.S. Cl. 137—117 **5 Claims**



To counteract in a hydraulic governor for the effect of the decrease, at increased temperatures, in the flow that is delivered by a high-pressure displacement-type fuel pump upon the pressure drop produced by the flow in a metering orifice, temperature-responsive means are provided which at increased temperatures reduce the area of the metering orifice in proportion with the reduction in the volumetric effi-

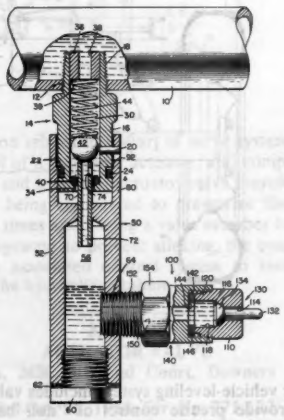
ciency of the pump that is due to the drop in viscosity of the hydraulic liquid at such higher temperatures.

3,563,263
SYSTEM FOR STORING PETROLEUM PRODUCTS
James P. Benson, 54 Gibbon Blvd., Cockeysville, Md. 21030
Filed Jan. 2, 1968, Ser. No. 695,263
Int. Cl. F16k *31/18*
U.S. Cl. 137—202 15 Claims



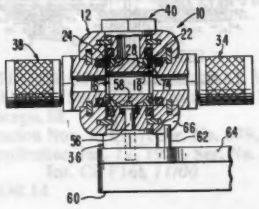
A system and process for storing petroleum products characterized by an underground manifold into which a plurality of underground tanks are vented and which in turn is vented to the atmosphere by a single line. A valving system is employed in conjunction with the vent lines running between the individual tanks and the manifold which automatically closes the vent line during the tank filling operation and stops the flow of the product at a level which provides sufficient additional tank storage capacity to subsequently accommodate the quantity of product in the fill hose. The valving system includes a venting bypass line which can be then opened to recycle the valving system, to permit the quantity of product in the fill line to flow into the tank and to vent the tank to the atmosphere through the manifold.

3,563,264
RESEARCH ANIMAL WATERING APPARATUS
Charles P. Boegli, Woodlawn, and Delbert Steigerwald, Terrace Park, Ohio, assignors to The Fieldstone Corporation, Cincinnati, Ohio
Original application Jan. 31, 1967, Ser. No. 612,855, now Patent No. 3,431,891. Divided and this application Sept. 5, 1968, Ser. No. 757,706
Int. Cl. A01r *7/00*
U.S. Cl. 137—209 15 Claims



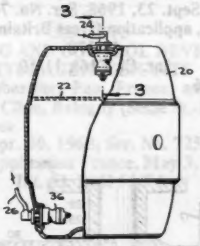
Watering apparatus actuatable by individual animals, and elements thereof including a valved air trap arranged to prevent communication of disease and contamination amongst caged animals in a battery of cages, the apparatus being easily and quickly serviced without wetting the cage floors and without interrupting the supply of water to cages previously serviced.

3,563,265
BALL VALVE ASSEMBLY
Charles H. Graham, Mountain View, Calif., assignor to Gra-Tec, Inc., Los Altos, Calif., a corporation of California
Continuation-in-part of application Ser. No. 617,145, Feb. 20, 1967, which is a continuation of application Ser. No. 515,848, Dec. 23, 1965, now abandoned, which is a continuation-in-part of application Ser. No. 432,598, Feb. 15, 1965, now abandoned. This application Sept. 15, 1967, Ser. No. 668,074
Int. Cl. F16l *29/00*; F16k *5/06*
U.S. Cl. 137—269 19 Claims



An assembly comprised of a distribution block having a plurality of outer faces with each of at least certain of the faces provided with a bore extending into the block and a ball valve member disposed within the block to provide a fluid flow path therethrough. A fitting member is provided for each bore respectively with the fitting members being of any desired configuration to permit the entire assembly to be quickly connected and disconnected in building block fashion, to form a fluid valve from any one of a number of different combinations of blocks and fitting members.

3,563,266
QUICK-CONNECT CONVERSION ADAPTER FOR BEER KEGS
Harry E. Berry, 3510 SW. 32nd Ave., Hollywood, Fla. 33023
Filed Nov. 21, 1968, Ser. No. 777,845
Int. Cl. F16k *43/00*
U.S. Cl. 137—323 4 Claims

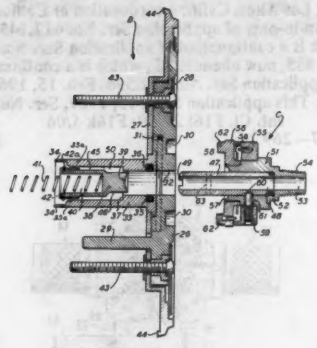


An adapter for enabling the use of quick-connect couplings on conventional beer kegs of the type having a recess butterfly valve on the end of a valve body cup on the interior of the keg, the adapter being a cylindrical tubular body member having one end fitting over a rotatable shaft type actuator for the butterfly valve and having a radially extending flange with a resilient sealing means adjacent the flange and radially extending lugs extending from the flange for engaging an inclined shoulder on the inner surface of the valve body cup so that rotation of the adapter seals the adapter in the valve body cup and also opens the butterfly valve so that all flow must be directed through the adapter.

3,563,267
GAS DISPENSING DOUBLE CHECK VALVE CONSTRUCTION

Charles S. Thompson, Madison, Wis., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Filed Sept. 30, 1968, Ser. No. 763,683
Int. Cl. F16k *15/18, 43/00*
U.S. Cl. 137—329.1 7 Claims

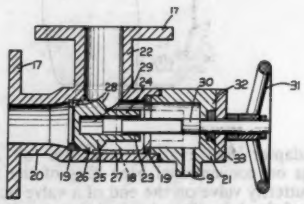


A valve construction comprising an outlet and an adapter, the outlet comprising a primary and secondary housing adapted to be fitted together under a gas keying arrangement, the primary housing including a primary check valve and the secondary housing including a secondary check valve, the secondary check valve being constantly maintained in open position when said primary housing is gas key fitted into the secondary housing, the dimensions of the respective housings being such that plaster finishes of varying thickness are permitted, the primary housing having an adapter keying arrangement so that only a specific adapter can be fitted thereinto, the specific adapter moving the primary check valve to open position to permit gas flow passed the secondary check and primary check through the adapter to the area of its final use, the primary housing and primary check valve therein having at least a pair of seals acting to prevent blow-by through the primary housing.

3,563,268
VALVE SYSTEMS

Robert S. Williams, Upper Arley, near Bewdley, England, assignor to G.W.B. Boilers Limited, Dudley, England

Filed Sept. 23, 1968, Ser. No. 761,650
Claims priority, application Great Britain, Sept. 23, 1967, 43,378
Int. Cl. F16k *31/50*
U.S. Cl. 137—386 8 Claims

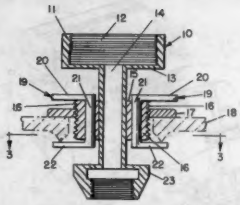


A valve system for a liquid-containing vessel such as a boiler in which a valve chamber between connections leading to the vessel, to a control device and to exhaust contains a valve head which can close the connections to the vessel and to exhaust but can not close the connections to the control device.

3,563,269
LOCK FOR GASOLINE PUMP

James E. Sarsfield, Rte. 1, Box 138, Goldendale, Wash. 98620

Filed Jan. 14, 1969, Ser. No. 790,997
Int. Cl. F16l *5/00*
U.S. Cl. 137—590 3 Claims

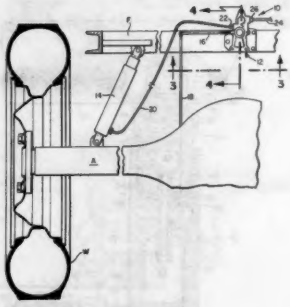


This invention consists of an internally threaded vertically disposed hollow receptacle adapted to receive the lower end of a portable gasoline pump that may be of the manually operated type. The aforesaid receptacle has its lower end provided with a hollow rectangular member having an externally threaded shoulder located in the vertical center thereof. The just mentioned shoulder is provided with a nut that rests on top of the gasoline drum to which the pump is secured by means of this novel invention. Two diametrically opposed U-shaped members, which I personally call dogs, each has its vertical portion passing through the aforesaid shoulder. The upper end of each dog is in the form of a handle by which the dog can be rotated to lock the device in place on the gasoline drum since the lower end of each dog terminates in a horizontally disposed member adapted to fit under the inside of the drum when the dog is turned to a locked position, thus locking the gasoline pump to the drum.

3,563,270
VALVE FOR VEHICLE-LEVELING SYSTEM

Carl B. Denny, Mc Ewen, Tenn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 11, 1969, Ser. No. 848,953
Int. Cl. F16k *11/02, 31/12*
U.S. Cl. 137—625.21 10 Claims

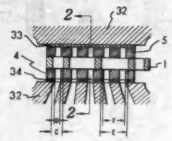


Valve for vehicle-leveling system includes valve plate apertured to provide precise control of "null band" as plate moves in its plane. Simple dashpot means delays action of valve until it is clear that out-of-level condition is not from road action.

3,563,271
FLAT SLIDE VALVE

Kazuyoshi Marumo, Tetsuo Kukuminato, and Yoshihiro Nakada, all of 132 Chigusashinden, Osawa-cho, Kimitsugun, Chibaken, Japan

Filed Nov. 1, 1968, Ser. No. 772,603
Claims priority, application Japan, Nov. 9, 1967, 71694
Int. Cl. F16r *11/06*
U.S. Cl. 137—625.25 2 Claims

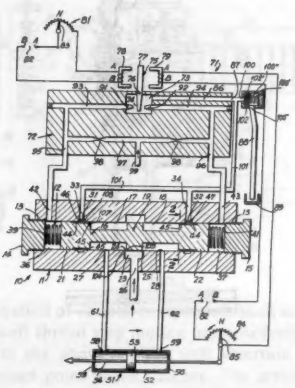


The present invention relates to a flat slide valve characterized in that a pair of spacers and a slide board having connecting ports and pressure balancing holes are fitted intimately between two guide plates having valve holes and pressure balancing holes, with the thickness of said slide board being formed slightly thinner than that of the spacers, and that the pressure balancing holes for preventing augmentation of controlling power of the slide board by fluid pressure are formed in communication with the corresponding valve holes in said two guide plates and said spacers.

3,563,272
SERVOCONTROL VALVE AND SYSTEM

Jean Mercier, 501 Bloomfield Ave., Caldwell, N.J. 07006

Original application Dec. 5, 1966, Ser. No. 599,210, now Patent No. 3,477,472, dated Nov. 11, 1969. Divided and this application Aug. 21, 1969, Ser. No. 851,907
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.66 6 Claims



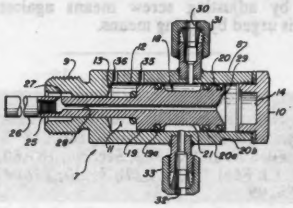
This invention relates to the art of servo systems to effect precise control of a hydraulic actuator, and comprises a distributor valve and a control actuator valve therefor, the distributor valve being conformed to pressurize the hydraulic actuator at all times and having a valve member balanced by capillary passageways to prevent sticking, the control actuator having an associated control system to restrain rapid movement of the hydraulic actuator.

3,563,273
ACTUATOR VALVE

Carl R. Mills, 2626 Diamond Court, Downers Grove, Ill. 60515

Filed Oct. 28, 1968, Ser. No. 771,173
Int. Cl. F16k *11/07*; F01l *25/04*
U.S. Cl. 137—625.69 6 Claims

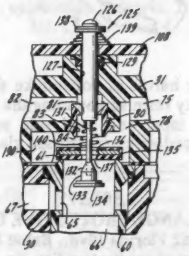
An actuator valve for a fluid control used in reciprocating or sequence operations of fluid operated devices. The valve is characterized by a simplified spool structure reciprocated by an actuating stem projecting into a cylinder cavity containing the spool. The valve is a three way valve in that it alternately connects a pilot port to an air supply port, or to an exhaust port in response to spool reciprocation.



3,563,274
SEQUENTIALLY OPERATED PLURAL VALVES

Edward J. Tischler, St. Paul, Minn., assignor to Ecodyne Corporation, Chicago, Ill.

Original application Nov. 1, 1967, Ser. No. 679,721. Divided and this application Jan. 12, 1970, Ser. No. 002,262
Int. Cl. F16k *11/00*
U.S. Cl. 137—630.14 5 Claims

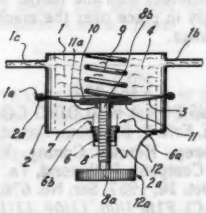


A valve arrangement for controlling a variable cycle water conditioning operation. Main inlet and outlet valves provide three-position, three-way control and three-position, four-way flow control, respectively, with positive prevention of brine leakage and more efficient cycle transition among the advantages.

3,563,275
BALANCING AND CONTROL DEVICES FOR HYDRAULIC CIRCUITS

Jules Antonin Sombardier, Pau, France, assignor to Societe dite: Projecteurs Cibie, Bobigny (Seine St.-Denis), France, a company of France

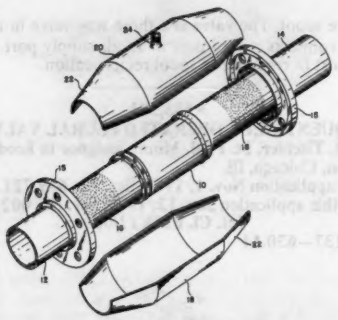
Filed Apr. 30, 1968, Ser. No. 725,305
Claims priority, application France, May 3, 1967, 105,165
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 3 Claims



A balancing and control device, for use in a hydraulic circuit, which can be adjusted to compensate for loss of hydrau-

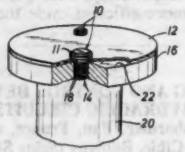
lic fluid by leakage, evaporation etc. The device comprises a casing which, together with a diaphragm, forms an enclosure. The enclosure is connected to a hydraulic circuit. The position of the diaphragm and thus the volume of the enclosure is adjustable by adjusting screw means against which the diaphragm is urged by spring means.

3,563,276
PIPE JOINT COCOON
Hanford Z. High, Short Hills, and Stephen Lesky, Metuchen, N.J., assignors to Bonded Products, Inc.
Filed Aug. 29, 1968, Ser. No. 767,601
Int. Cl. F16l 55/16; B22b 35/00; F16l 47/02
U.S. Cl. 138—99 **9 Claims**



Upper and lower halves of cocoonlike shell of glass cloth saturated with epoxy resin surrounding the pipe joint, held in place by masking tape, ends and side seams coated with epoxy resin reinforced with crisscrossed glass tape.

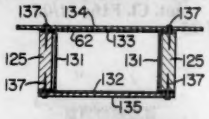
3,563,277
PIPE FLANGE PROTECTIVE COVER
Joseph Klipper, 9262 Florida Blvd., Baton Rouge, La. 70815
Continuation-in-part of application Ser. No. 728,676, May 13, 1968, now abandoned. This application Aug. 29, 1969, Ser. No. 857,287
Int. Cl. B65d 59/00; F16l 57/00
U.S. Cl. 138—96 **3 Claims**



In one exemplar form, a combination of a plastic plate having spaced apertures aligned with bolt apertures of a pipe or valve section flange and a ribbed retaining plug of an elastic material for insertion through the apertures of the plate into frictional gripping contact with the flange bolt apertures to hold the plate snugly in place over the machined surface of the pipe or valve flange.

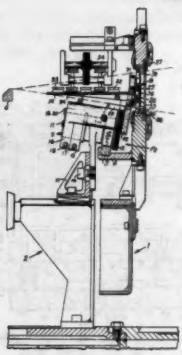
3,563,278
AIR DUCT MEANS FOR A BUILDING CONSTRUCTION
Daniel J. Schardein, Erik F. Barkman, Davad R. Johnson, and Ben W. Lillethorup, Henrico County, Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed Oct. 20, 1967, Ser. No. 676,960
Int. Cl. F16l 3/00, 11/04, 11/14
U.S. Cl. 138—107 **22 Claims**

This disclosure relates to air duct means for a building construction and method of making same in which said air duct means is made substantially of metallic foil and is readily collapsible for storage and handling and readily expandible for



fastening to associated supporting means comprising the building construction to thereby enable provision of an economical air conduit system in such building construction.

3,563,279
DRIVE MEANS FOR A WEFT CARRYING DEVICE IN CIRCULAR LOOMS
Armand Malchair, Herstal, Belgium, assignor to Peltzer & Fils S. A., societe anonyme, Verviers, Belgium
Filed May 27, 1968, Ser. No. 732,329
Claims priority, application Belgium, June 20, 1967, 700,194
Int. Cl. D03d 37/00
U.S. Cl. 139—13 **7 Claims**

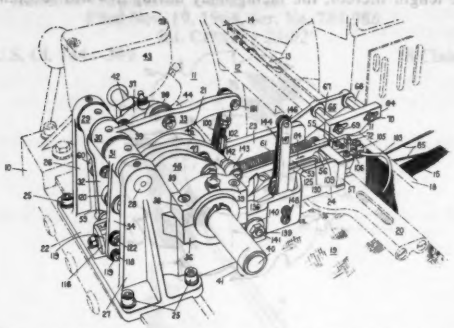


Drive means for a weft-carrying device in circular looms wherein the connection between the drive means and the driven means carried by the weft-carrying device, is a frictional engagement.

3,563,280
METHOD AND APPARATUS FOR TUCKED-IN SELVAGE
John A. Cugini, Hopedale, Mass., assignor to North American Rockwell Corporation, Pittsburgh, Pa., a corporation of Delaware
Filed June 2, 1969, Ser. No. 830,224
Int. Cl. D03d 47/48
U.S. Cl. 139—122 **7 Claims**

A selvage forming apparatus for shuttleless looms of the type where cut lengths of filling yarn are introduced into warp sheds, having a mechanical means for receiving and

holding the end of an inserted length of yarn, severing that end to a desired length and thence tucking it back into a



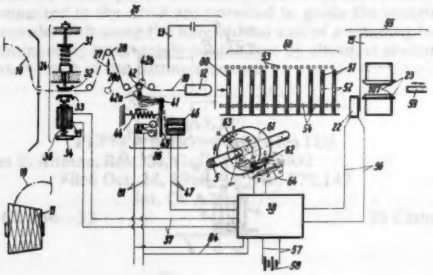
reopened shed for beat up with the next inserted length of yarn.

3,563,281

APPARATUS AND METHOD FOR OPERATING A WEAVING MACHINE

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Mar. 6, 1969, Ser. No. 804,813
Claims priority, application Switzerland, Mar. 8, 1968, 3522/68
Int. Cl. D03d *51/18, 51/34*
U.S. Cl. 139—336 **1 Claim**



The actuation of various components such as a weft thread brake or weft thread stop motion are positively controlled in response to the arrival of the weft insertion element at a predetermined point in the catcher. The arrival of the weft insertion element can be determined mechanically, photoelectrically or magnetically and such determination is used to actuate the other machine components in dependence thereon.

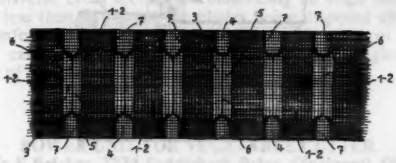
3,563,282

METHOD OF WEAVING A POCKETED TAPE

Jean Antonin Philippe Gonon, Saint-Just-Malmont Haute-Loire, France

Filed Jan. 13, 1969, Ser. No. 790,675
Int. Cl. D03d *1/04, 23/00*
U.S. Cl. 139—390 **4 Claims**

Woven pocketed curtain tape has spaced pockets which extend across the major part of its width. The base fabric between the pockets is woven from weft threads and two sheets of warp threads. The pockets are defined by ribs formed by a number of weft threads grouped together. The base fabric of the pockets is formed by the weft threads woven with one sheet of warp threads over the whole width of the tape. The cover fabric of the pockets is woven from the other sheet of warp threads and the weft threads over



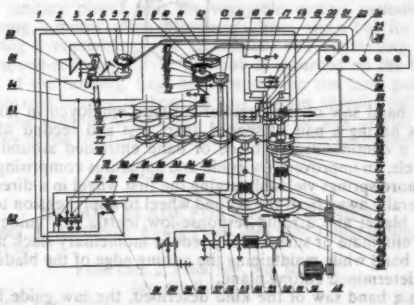
only a portion of the width of the tape. A number of tapes may be woven contiguously in a single fabric and then separated by cutting.

3,563,283

AUTOMATIC MACHINE FOR MAKING STIRRUPS AND STRUCTURAL REINFORCEMENT

Georgi D. Tufektshiev, Gabrovo, Bulgaria, assignor to Maschinostroitelen Zavod Mir, Mihailovgrad, Bulgaria

Filed July 5, 1968, Ser. No. 742,715
Claims priority, application Bulgaria, July 7, 1967, 8279
Int. Cl. B21d *7/14*
U.S. Cl. 140—71 **13 Claims**



An electrically programmed automatic apparatus for bending stirrups and reinforcing rod for concrete, wherein pneumatic control is provided for the bending device and a clutch automatically cuts out the feed roller train for the rod and cuts in the bending device in a pneumatically energized state of the clutch system but connects the feed arrangement and disconnects the bender in a pneumatically deenergized state of the latter. Contactor arrangements control the measurement of the rod length and machine settings may be programmed by pushbuttons upon a panel.

3,563,284

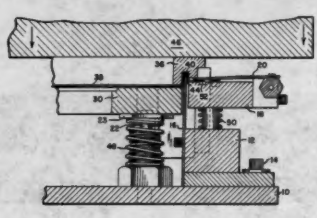
SYSTEM FOR FRAMING SCREENS

George F. Gordon, Nashua, N.H., assignor to Industrial Reproductions, Inc., Nashua, N.H.

Filed Aug. 22, 1967, Ser. No. 662,361
Int. Cl. B21f *33/02*
U.S. Cl. 140—109 **8 Claims**

A system for framing printing screens with uniform tension and deflection includes a fixture for receiving elongated resilient splines in predetermined locations. A screen is placed over the splines so that the splines define the

periphery of a framed screen. A frame, channeled to receive the splines, is then placed over the screen and is compressed

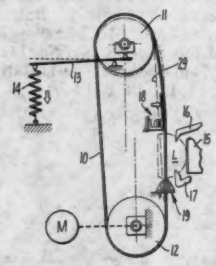


in the fixture to simultaneously jam the splines in the frame channels and thereby lock the screen in the frame.

3,563,285
BAND SAW GUIDE AND APPARATUS

Elbridge W. Thrasher, Ukiah, Calif., assignor to Masonite Corporation

Filed July 10, 1969, Ser. No. 840,613
Int. Cl. B27b *13/08, 13/10*
U.S. Cl. 143—27 **9 Claims**



A band saw of the commercial type employed in lumber mills having a pair of spaced apart first and second wheels and a continuous saw blade or band entrained around said wheels, an improved saw guide and apparatus comprising one or more springs yieldably urging the first wheel in a direction generally away from the second wheel to apply tension to the saw blade; and a rapid response-low inertia saw guide that will eliminate or substantially reduce momentary slack in the saw band while maintaining the cutting edge of the blade in a predetermined cutting plane.

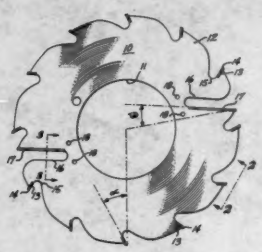
In a band saw of the kind described, the saw guide being more particularly characterized in that it is disposed intermediate the first and second wheels and comprises a contact member positioned to engage the inside surface of the blade as the blade moves from the first wheel toward the second wheel, the contact member having a first contact portion that provides a fixed line of contacts forward of an imaginary line connecting the points of tangency between the wheels and a movable contact portion that contacts the blade in a region intermediate the first contact portion and the first wheel; and a rapid response-low inertia means urging the movable contact portion against the saw blade to maintain tension in that area of the blade between the first wheel and the fixed line of contacts.

3,563,286
SAW

Keene S. Strobel; Washington Everett, and Peter E. Heiser, Issaquah, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of application Ser. No. 702,858, Feb. 5, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 696,202, Jan. 8, 1969, now abandoned. This application Mar. 18, 1970, Ser. No. 019,531
Int. Cl. B27b *33/08*
U.S. Cl. 143—140 **8 Claims**

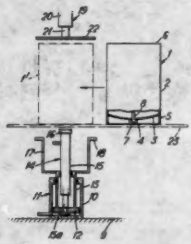
A saw having a plurality of spaced teeth around the periphery of a saw disc and a plurality of slots cut inwardly of the periphery of the saw disc, the slots preferably being faced on the cutting side with a facing inlay extending substantially the length thereof, the facing inlay having a width substantially the same, or slightly less than the width of the kerf of the cutting teeth. The cutting edge of the slots is in a negative hook position with respect to saw motion and to a radial line extending from the center of the saw blade to the periphery thereof.



3,563,287
MACHINES FOR FILLING BEER KEGS AND LIKE CONTAINERS

Maurice Ruddick, Strood, Rochester, England, assignor to Burnett & Rolfe Limited, Strood, Kent, England

Filed Feb. 3, 1969, Ser. No. 795,988
Claims priority, application Great Britain, Feb. 16, 1968, 7793/68
Int. Cl. B65b *31/06*
U.S. Cl. 141—59 **5 Claims**

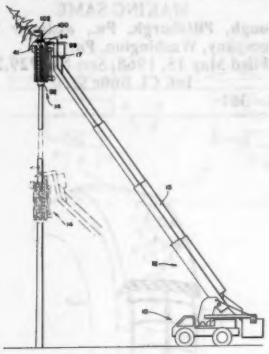


A machine for filling from below beer kegs and similar containers having in one end a filling opening provided with a self-closing valve and a spear has a container support which is mounted so that it is movable upwards and downwards by a driving mechanism and has its filling head with the usual duct for the supply of liquid through the filling opening around the spear and a duct for withdrawing gas through the spear arranged so that it is movable with the support to which it is attached by a resilient mounting, which may be for example a pneumatic ram, and has an abutment mounted above the support. The parts of the machine are arranged so that, in order to fill a container after it has been moved into the machine, the support is moved upwards under the container and the container is raised until it is clamped between the support and the abutment and the head is held against the filling opening by the resilient mounting with the force between the filling head and the part of the container surrounding the filling opening dependent entirely upon the resilient mounting.

ERRATA

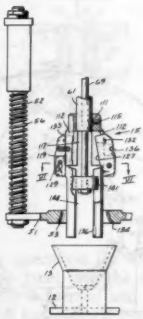
For Classes 143—27 and 143—140 see:
Patent Nos. 3,563,285 and 3,563,286

3,563,288
TREE-HARVESTING AND PROCESSING DEVICES
Roy D. Brownell, Aurora, Ill., assignor to Baldwin-Lima-Hamilton Corporation, Chicago, Ill.
Filed Nov. 19, 1968, Ser. No. 784,986
Int. Cl. A01g *23/02*
U.S. Cl. 144—309 18 Claims



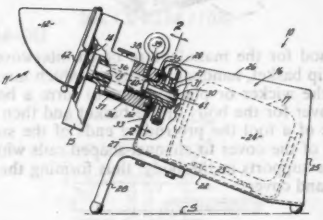
A tree-harvesting and processing method and device for harvesting standing trees, the device including a severing and crawler unit supported on a vehicle-mounted telescopic boom. The severing and crawler unit is adapted to continuously move the device longitudinally of a standing tree while severing the same into a plurality of sections and includes an endless chain drive having a plurality of fixed cutting and traction elements spaced therealong. Guide means operatively connected to the drive are provided to guide the severing and crawler unit along the longitudinal axis of a standing tree to continuously transversely cut the tree by alternate severing action by each of the cutting elements.

3,563,289
PEPPER CORING APPARATUS
James E. Altman, Box 334, Gray, Ga. 31032
Filed Oct. 24, 1968, Ser. No. 770,147
Int. Cl. A23n *3/12*
U.S. Cl. 146—52 20 Claims



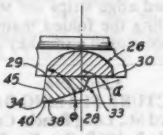
An apparatus for coring peppers comprising a frame, an endless conveying means mounted on the frame, a plurality of pepper receiving cups carried by the endless conveying means from a receiving station, through the coring station and then to a discharge station, means mounted on the frame and disposed above the cups for cutting and for removing the cores from the remainder of the pepper, and means for rotating and simultaneously advancing the cutting and removing means into the peppers. The core cutting and removing means includes a mounting member suspended from the rotating and advancing means, a pair of cutting blades mounted for pivotal movement about a substantially horizontal axis between a cutting position and a core gripping position, each blade being formed with an arcuate configuration in transverse cross section circumscribing an angle substantially less than 180°, and the blades being disposed about a circumference of a common circle to provide a pair of vertically extending openings between adjacent, longitudinal edges of the blades.

3,563,290
POWER UNIT FOR VEGETABLE CUTTER
Melvin E Bricker, 2723 Saddleback Drive, Cincinnati, Ohio
Filed May 20, 1970, Ser. No. 039,002
Int. Cl. B26d *1/28, 4/22*
U.S. Cl. 146—115 5 Claims



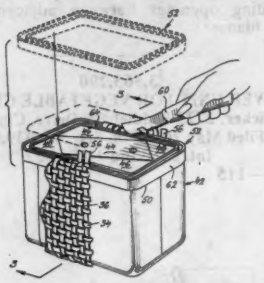
A unitary power unit for vegetable cutters including a housing, a motor, a speed-reducing drive, and a hub for supporting a vegetable cutter attachment and connecting it to the speed-reducing drive. The hub is mounted on the front wall of the housing. Legs are mounted on the front portion power unit to raise it above its rear portion, thereby tilting it and any implement attached thereto. The legs extend forwardly of the front wall to provide stability during operation.

3,563,291
ROTARY BLADE FOR MEAT GRINDER
Eugene A. Anderson, Lewis Place, Box 895, Douglasville, Ga. 30134
Filed Oct. 2, 1968, Ser. No. 764,407
Int. Cl. B02c *18/18*
U.S. Cl. 146—189 11 Claims



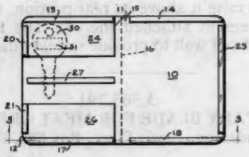
A meat grinder in which a worm conveyor on a horizontal shaft feeds the meat to be ground toward a rotary blade or chopper provided with radially extending blade arms. The blade arms move in a rotary path and cooperate with the surface of the perforated plate for cutting or chopping action. Each blade arm has a wedge-shaped blade block which diverges outwardly. Each blade block, as a leading edge, has a straight cutting edge for riding on the surface of the plate. This cutting edge is disposed forwardly of the radial axis of the blade arm and converges outwardly toward this radial axis. The wedge-shaped blade blocks assure even wearing of the blade blocks against the plate.

3,563,292
METHOD OF MAKING A BASKET WEAVE HANDBAG
Michael Gordon, and Eric Alba-Teran, 33 East 33rd St., New York, N.Y. 10016
Filed Oct. 30, 1968, Ser. No. 771,901
Int. Cl. B27j *1/02*
U.S. Cl. 147—48 **9 Claims**



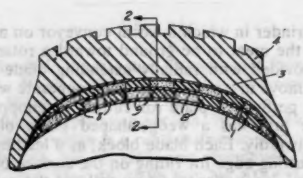
A method for the manufacture of an interwoven wicker, plastic strip basket, handbag or luggage which involves interweaving the wicker or plastic strips to form a body and to form a cover for the body of the basket and then anchoring by means of a tool the protruding ends of the strips of the body and of the cover to channel-shaped rails which rest on removable supports in the body, thus forming the frames of the body and cover.

3,563,293
KEY CASE
Robert E. Fisher, 6422 Olde Stage Road, Boulder, Colo.
Filed Apr. 16, 1969, Ser. No. 816,619
Int. Cl. A45c *11/32*
U.S. Cl. 150—40 **10 Claims**



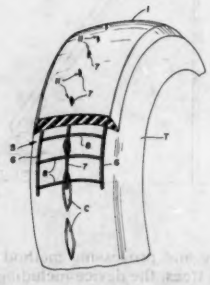
A key case formed of sheet material foldable on itself into a closed container, has strips of magnetized material secured to one-half of the sheet for holding keys that are at least partially paramagnetic or include a magnetic strip thereon, and a plurality of magnetized edge strips are secured to the edges of the sheet for holding the folded material in closed position, and forming when closed a thin key case.

3,563,294
PUNCTURE-SEALING BAND
Alex Chien, 345 W. 3rd St., Long Beach, Calif. 90812
Filed July 2, 1968, Ser. No. 742,041
Int. Cl. B60c *17/00*
U.S. Cl. 152—346 **4 Claims**



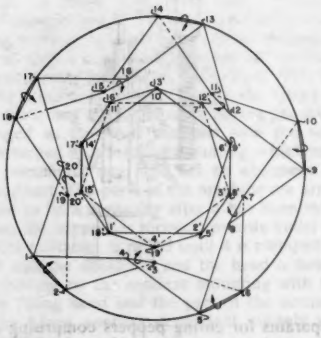
This disclosure describes an inner, protective flexible linear or band which is positioned adjacent the inner radial wall of a pneumatic tire, said linear having a plurality of structural blocks sandwiched therebetween, said plyable sheets along with block structures form fluid retaining pockets whereby a self-sealing fluid composition is encased therein, said fluid being released to fill an aperture formed by a puncture to the pressurized tire.

3,563,295
VEHICLE TIRE CONSTRUCTION AND METHOD OF MAKING SAME
Dean R. Hough, Pittsburgh, Pa., assignor to Washington Rubber Company, Washington, Pa.
Filed May 15, 1968, Ser. No. 729,259
Int. Cl. B60c *9/10*
U.S. Cl. 152—361 **6 Claims**



A method of providing a direct and very short venting path for the cord plies normally built into the carcass of a pneumatic vehicle tire, comprising applying a net of cord onto the inner surface of a camel-back strip while still in hot, plastic condition, projecting circumferentially spaced strands of said net through the thickness of the tread layer, and finally applying the composite tread and net onto the buffed worn surface of the tire in a manner so that certain strands of the net contact the ply layers of cord of the tire carcass.

3,563,296
FOLDED ENDLESS REINFORCEMENT FOR PNEUMATIC TIRES
Thomas A. Wells, 504 Glendalyn Ave., Spartanburg, S.C.
Filed Nov. 18, 1968, Ser. No. 776,333
Int. Cl. B60c *9/14*
U.S. Cl. 152—361 **11 Claims**



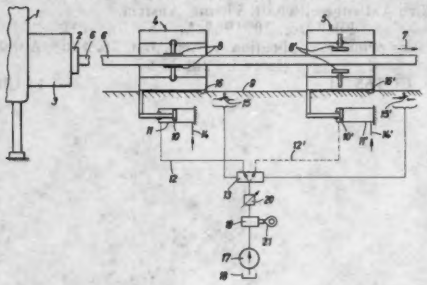
An endless reinforcement for a pneumatic tire which comprises continuous cord in an endless folded strip, the cord being disposed across the width thereof from one side to the other in a generally zigzag pattern at an angle to the edges with reversals at the edges. Also, the method of producing such a reinforcement.

3,563,297

METHOD AND APPARATUS FOR WITHDRAWING CONTINUOUS HORIZONTAL CASTINGS

Alfred J. Wertli, Poststr. CH, 8406 Winterthur, Switzerland

Filed Nov. 14, 1966, Ser. No. 593,810
Claims priority, application Switzerland, Nov. 15, 1965, 15689/65
Int. Cl. B22d *11/12*
U.S. Cl. 164—82 10 Claims



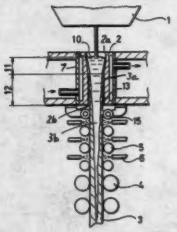
The continuous casting is pulled from the mold by sequentially engaging the movable withdrawal tables on the casting and pulling the casting with the engaged withdrawal table. The withdrawal tables operate in unison with each other so that as one pulls the casting, the other retreats for a subsequent pull.

3,563,298

METHOD OF CONTINUOUSLY CASTING BARS FOR PREVENTING DISTORTION DURING SOLIDIFICATION OF THE BARS

Werner Stauffer, Emmenbrucke, Armin Thalmann, Uster, and Carl Kueng, Emmenbruke, Switzerland, assignors to Aktiengesellschaft Der Von Moos, Schen Eisenwerke, Luzern and Concast AG, Zurich, Switzerland

Filed Dec. 27, 1967, Ser. No. 693,884
Claims priority, application Switzerland, Dec. 28, 1966, 18,686/66
Int. Cl. B22d *11/00*
U.S. Cl. 164—82 6 Claims



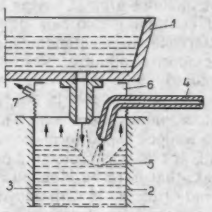
A continuous casting operation for forming bars is comprised of pouring molten steel into the inlet end of a mold chamber in which the bar is formed and from which the bar is withdrawn while it still has a liquid core. Within the mold chamber the molten steel forms a liquid level, and a first section of the chamber having converging walls commencing at the liquid level and extends downwardly for applying a symmetrical cooling effect to the molten steel and, at the same time, constraining the outer surface of the bar as it contracts and develops a solidified outer layer or crust. The constraint afforded by the walls of the first section prevents a distortion in the shape of the bar as it begins to solidify. From the first section of the chamber the bar passes through a second section where the cooling operation is continued but without any constraint so that a gap develops between the bar and the walls of the chamber. After passage through the second section the bar may be withdrawn from the outlet end of the chamber or, alternatively, it may pass through another section wherein increased cooling is effected and then, if necessary through a further section where the cooling effect is decreased as in the second section. From the outlet the bar is guided to rollers which withdraw it from the mold chamber. Before reaching the rollers, cooling means, such as water sprays, are provided for cooling the casting. The mold chamber is provided with means for circulating a coolant fluid for removing heat from the molten steel within the mold chamber.

3,563,299

PROCESS FOR THE WASHING AND PURIFYING OF MOLTEN METALS

Manfred Schrage, Dudenhofen near Offenbach, Germany, assignor to Messer Griesheim, GmbH, Frankfurt Main, Germany, a corporation of Germany

Filed Nov. 1, 1967, Ser. No. 679,684
Claims priority, application Germany, Nov. 12, 1966, M71642
Int. Cl. B22d *11/00*
U.S. Cl. 164—82 6 Claims



A process for washing and purifying molten metals in continuous casting operations includes injecting a flash gas on the molten surface of the continuously moving workpiece in such a manner that the drawn off gases prevent the admission of air.

3,563,300

CENTRIFUGAL CASTING OF A COMPOSITE ROLLER

Juntaro Honda, Masahiro Fukuda, Toru Endo, Yoshihiro Nakagawa, and Tamotsu Hashizume, Amagasaki-shi, Japan, assignors to Kubota Iron & Machinery Works, Ltd., Osaka, Japan, a Japanese company

Filed Apr. 22, 1968, Ser. No. 722,913
Claims priority, application Japan, July 1, 1967, 42/42265
Int. Cl. B22d *19/00, 13/02*
U.S. Cl. 164—94 4 Claims

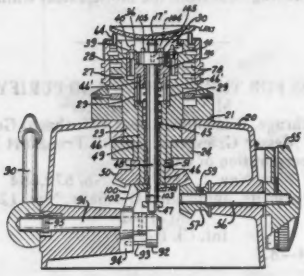
A highly viscous flux at high temperature added to a mass of outer layer-forming metal during centrifugal casting to produce and maintain a flux coat of the outer layer subsequent to its solidification and prior to adding the molten mass of inner layer-forming metal with the mold at rest.

3,563,301

APPARATUS FOR GENERATING A LENS

Richard J. McCall, Summer Hill, and Robert C. Irwin, Stony Creek Township, Pa., assignors to Shuron Continental Division of Textron, Inc., Rochester, N.Y., a corporation of Rhode Island, by mesne assignment.

Original application May 1, 1967, Ser. No. 635,232. Divided and this application Mar. 21, 1969, Ser. No. 834,185
Int. Cl. B22d *17/24*
U.S. Cl. 164—332 **8 Claims**



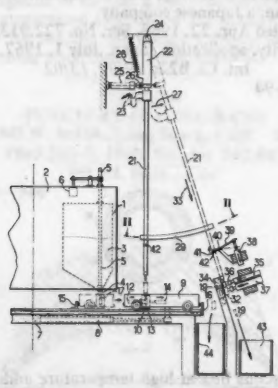
The apparatus includes a mold having a cavity open at its upper end, and containing two sets of spaced projections defining two reference lines extending diametrically of the cavity. One set comprises a pair of pins mounted on opposite sides of an angularly adjustable ring, which surrounds a piston that is axially reciprocable in the bottom of the mold for ejecting molded blocks therefrom. The second set comprises either two wedge-shaped formations on opposite sides of the cavity wall, or two pins projecting from the face of the piston. The blank, that is to be blocked, is placed sealingly over the upper end of the mold with a layout line thereon registering with the second set of projections. The ring is then adjusted until the line defined by said pins corresponds to the desired cylindrical axis for the blank; and molten blocking material is then fed to the cavity to mold to the blank a block which will contain recesses corresponding to said sets of projections.

3,563,302

AUTOMATIC CASTING HAVING SPRUE-REMOVING MEANS

Marcel Thevenin, Rue de l'Avenir, Champagnole Juea, France

Filed Jan. 22, 1969, Ser. No. 792,986
Claims priority, application France, Jan. 25, 1968, 137,449
Int. Cl. B22d *29/00*
U.S. Cl. 164—404 **4 Claims**



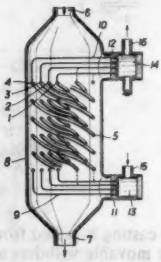
An automatic casting machine is equipped with a transfer rod having a tip adapted to be inserted in the sprue of a casting while the sprue is still molten. The mold is then opened, the casting lifted out of the mold by the transfer rod, the tip of which is now fast to the sprue, and transferred to a work table at which the transfer rod, sprue and casting separated from each other.

3,563,303

METHOD AND APPARATUS FOR INCREASING UNIFORMITY OF HEAT TRANSFER

Paul Viktor Gilli, Vienna, Kurt Fritz, Klosterneuburg, and Walter Roznovsky, Vienna, Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria

Filed Dec. 20, 1968, Ser. No. 785,491
Claims priority, application Austria, Jan. 15, 1968, A380/68
Int. Cl. F28f *27/02*
U.S. Cl. 165—1 **13 Claims**



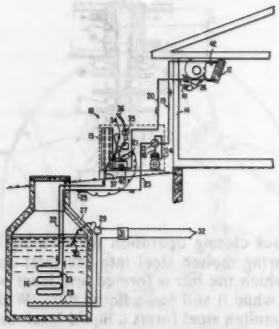
A method and apparatus for increasing the uniformity of heat transfer in a heat exchanger. The flow of the medium which is to be heated is regulated in such a way as to provide a uniform outlet temperature of this medium at the outlet ends of the tubes. This is achieved by throttling the flow of the medium into the inlet ends of the tube. After measuring the temperature of the medium at the outlet ends of the tubes, a throttling at the inlet ends is provided to achieve uniform temperatures at the outlet ends, respectively.

3,563,304

REVERSE CYCLE REFRIGERATION SYSTEM UTILIZING LATENT HEAT STORAGE

William L. McGrath, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y., a corporation of Delaware

Filed Jan. 28, 1969, Ser. No. 794,634
Int. Cl. F25b *29/00*
U.S. Cl. 165—2 **5 Claims**



A reverse cycle refrigeration system having an indoor heat exchanger, an outdoor heat exchanger, a refrigerant compressor, and reversing valve means for selectively operating the system to provide heating or cooling from the indoor heat exchanger. The outdoor heat exchanger includes a portion disposed in heat exchange relation with a pool of water and another portion disposed in heat exchange relation with am-

bient air during heating mode operation. The latent heat of fusion of the water is extracted to provide indoor heating while freezing the water in the system. An electrical resistance heater is provided so that the ice formed in the water may be melted during periods of time when electric rates are low.

3,563,305

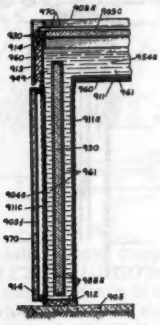
PROCESS AND APPARATUS FOR MODULATING TEMPERATURES WITHIN ENCLOSURES

Harold R. Hay, 795 Roble, Menlo Park, Calif. 94025

Continuation-in-part of application Ser. No. 668,202, June 26, 1957, now abandoned, which is a continuation-in-part of application Ser. No. 163,381, Dec. 19, 1961, now abandoned, and a continuation-in-part of 610,597, Jan. 20, 1967, now Patent No. 3,450,192. This application Apr. 14, 1969, Ser. No. 815,785

Int. Cl. F24j *3/02*; F28d *21/00*

U.S. Cl. 165—2 **6 Claims**



Enclosure temperatures are modulated by water heated by solar energy and cooled to ambient air. Control means include moving exterior insulation, enclosing or exposing the water, using forced air, and providing special means for heat storage and transfer. Water ponds horizontally disposed atop the enclosure, or in floor plenums and frequently in direct thermal exchange with underlying space, or water circulating in walls by thermosiphon action may be used separately or in combinations with the control means.

3,563,306

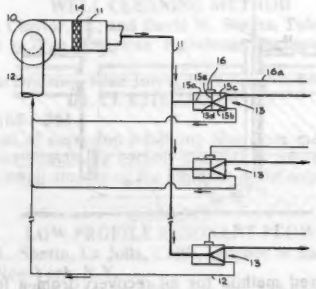
APPARATUS FOR AIR-CONDITIONING SYSTEMS

Gene W. Osheroff, 2813 Cameo Circle, Las Vegas, Nev. 89107

Continuation-in-part of application Ser. No. 801,930, Feb. 20, 1969, now abandoned. This application Sept. 15, 1969, Ser. No. 864,931

Int. Cl. F24f *3/00*

U.S. Cl. 165—22 **12 Claims**



The present invention concerns the application of fluidic devices to air-conditioning systems. More specifically, the present invention encompasses the use of fluidic valves by means of which heating and cooling can be controlled without moving parts being involved. Through the use of such devices, throttling as a means for controlling flow is eliminated altogether and the control of multizone air-conditioning is rendered more feasible.

3,563,307

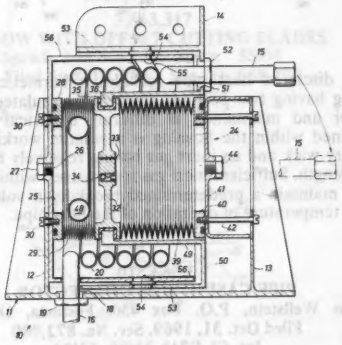
RADIATOR DEPLOYMENT ACTUATOR

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration in respect to an invention of; Hans M. Kolstee, Glen Cove, and William E. Simpson, Rego Park, N.Y.

Filed Feb. 2, 1970, Ser. No. 007,668

Int. Cl. F28d *11/00*

U.S. Cl. 165—86 **6 Claims**



An apparatus for mounting a radiator or other fluid-communicated vessel for hinged movement which includes a fluid line formed of spring material which is coiled within a housing and which tends to uncoil for deployment of the radiator, the rate of deployment being controlled by a damping means within the housing.

3,563,308

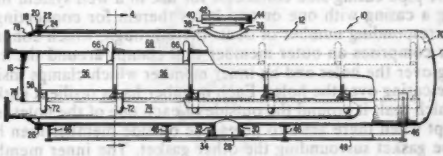
SUBMERGED CORE HEAT EXCHANGER

Joseph P. Rutledge, Brussels, Belgium, assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Apr. 21, 1969, Ser. No. 817,685

Int. Cl. F28d *1/06*

U.S. Cl. 165—74 **2 Claims**

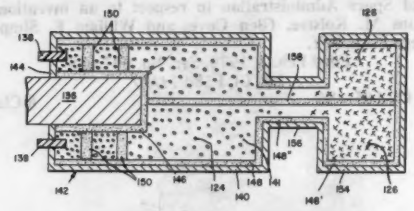


A heat exchanger having all of the separate cores thereof mounted together to form a single core assembly which is removably mounted within a cylindrical pressure vessel. The vessel is supplied with a refrigerant of sufficient depth to either partially or entirely cover the assembly. The separate cores have their respective inputs and outputs manifolded to separate pipes which pass through the walls of the vessel and permit circulation of the fluid to be cooled through the cores.

3,563,309
HEAT PIPE HAVING IMPROVED DIELECTRIC STRENGTH

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif., a corporation of Delaware

Filed Sept. 16, 1968, Ser. No. 759,854
Int. Cl. F28d *15/00*; H01j *7/24*
U.S. Cl. 165—105 8 Claims

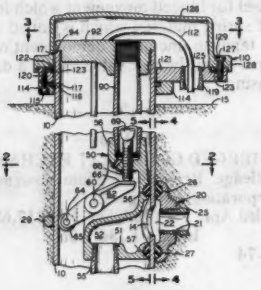


The disclosed heat pipe includes a hermetically sealed housing having two portions electrically insulated from one another and maintained at differing electrical potentials. Contained within the housing is a volatile working fluid, a capillary wick and an inert gas having relatively high dielectric strength. Sufficient inert gas is contained within the housing to maintain a predetermined breakdown voltage at the lowest temperature of operation of the heat pipe.

3,563,310
PIPE CASING SIDE CONNECTOR

William Wellstein, P.O. Box 430, Fostoria, Ohio 44830

Filed Oct. 31, 1969, Ser. No. 872,900
Int. Cl. E21b *23/00, 33/03*
U.S. Cl. 166—85 17 Claims



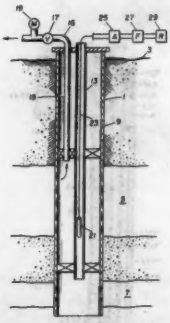
A pipe casing side connector for use in a well system having a casing with one or two holes therein for connecting a corresponding number of ducts therethrough, which connector comprises an outer member that clamps around the casing over the holes and an inner member which clamps inside the casing over the holes. Each member has a resilient gasket which seals it around the outside of each one of the holes, except when there are two holes, the outside member then has one gasket surrounding the other gasket. The inner member is supported from a freely swinging bridge which extends diametrically across the top of the pipe casing and has a depending rod or pipe preadjusted in length to support the inner member at the same distance from the top of the casing as are the holes in the side of the casing. The clamping means on the inner member comprises a lever which is operated by a screw mounted on the inner member and controlled by a tool which may extend through or along the depending supporting pipe for the inner member.

The top of the casing is provided with a cap independent of the inner member supporting means, which in the case of a well having a submersible electric pump also may be provided with a side duct for an electrical connection. Thus the inner member, the duct supported thereby and/or pump may easily be removed from the casing and replaced in the exact location by the inner member suspension means without touching or disconnecting the outer member of the connector.

3,563,311
INVESTIGATING A WELL TO DETERMINE SAND ENTRY

Nathan Stein, Dallas, Tex., assignor to Mobil Oil Corporation, a corporation of New York

Filed Sept. 2, 1969, Ser. No. 854,395
Int. Cl. E21b *47/10*
U.S. Cl. 166—250 7 Claims

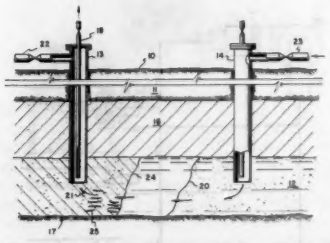


This specification discloses a method of investigating a well penetrating a fluid-bearing formation with a sound detector. The well is produced at a plurality of flow rates under conditions such that fluid flowing from the formation impinges against an interface within the well. The sound produced by the impingement of this fluid is monitored by the sound detector at each flow rate. From the information thus obtained, the flow rate and location at which sand is produced from the formation may be determined.

3,563,312
METHOD OF RECOVERING HYDROCARBONS FROM AN UNDERGROUND HYDROCARBON CONTAINING FORMATION

Robert W. Zwicky, Alberta, Canada, assignor to Shell Oil Company, New York, N.Y.

Filed Mar. 14, 1969, Ser. No. 807,196
Claims priority, application Canada, Feb. 21, 1969, 43,671
Int. Cl. E21b *43/24*
U.S. Cl. 166—261 2 Claims



An improved method for oil recovery from a formation using a combination of steam and in situ combustion drives comprising injecting steam via an injection well, followed by injecting a combustible gas via a production well and thereafter recovering oil via the injection well.

3,563,313

WELL CEMENTING METHOD USING QUICK GELLING CEMENT

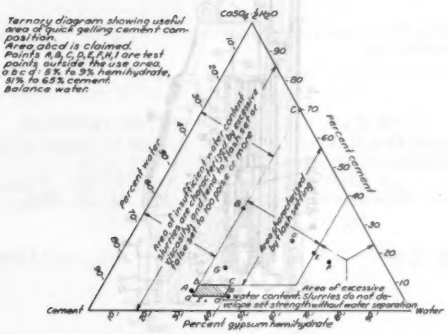
Lloyd B. Spangle, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 749,683, Aug. 2, 1968, now abandoned, which is a continuation-in-part of Ser. No. 701,994, Jan. 31, 1968, now abandoned. This application July 25, 1969, Ser. No. 859,223

No. 859,223

Int. Cl. E21b *33/138*

U.S. Cl. 166—292 3 Claims


Ternary diagram showing useful area of quick gelling cement composition.
Area abcd is claimed.
Points A,B,C,D,E,F,H,I are test points outside the use area.
a b c d : 8% to 9% hemihydrate, 8% to 65% cement.
Balance water.
CaSO4 1/2H2O
percent water
percent cement
percent gypsum hemihydrate
Area of insufficient slurry content slurries are unstable by excessive water separation (bleed) to 100 cc/sq. in. or more
Area of excessive slurry content. Slurries do not develop set strength without water separation.
Cement
Water

An improved hydraulic cement composition comprising critical proportions of $CaSO_4 \cdot 1/2H_2O$ and Portland cement, substantially free of kaolin, bentonite or other clay materials and balance water, which provides a slurry of initially low viscosity but having an accelerated rate of gelation and the method of use of such composition in underground cementing operations, most especially in such operations known as multistage well cementing.

3,563,314

SAND CONSOLIDATION METHOD

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed June 20, 1969, Ser. No. 835,225

Int. Cl. E21b *33/138*

U.S. Cl. 166—295 8 Claims

Method of and composition for the treatment of unconsolidated sandy formations to stabilize the formation comprising injecting a treating composition comprising an aqueous solution containing from about 15 to about 50 percent by volume of 2-hydroxyadipaldehyde into said formation, effecting polymerization of said adipaldehyde by contact with an acid-forming polymerization catalyst, and formation of a fluid permeable consolidated sand in said formation. The adipaldehyde solution may include a silane bonding agent.

3,563,315

WELL CLEANING METHOD

Edwin E. Claytor, Jr., and David W. Simms, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla.

No Drawing. Filed July 8, 1969, Ser. No. 840,055

Int. Cl. E21b *21/00, 43/28*

U.S. Cl. 166—304 4 Claims

Removal of corrosion-inhibiting film from metal surfaces by solvents containing carbon disulfide is prevented by including a small amount of the inhibitor in the solvent.

3,563,316

LOW PROFILE RESONANT PLOW

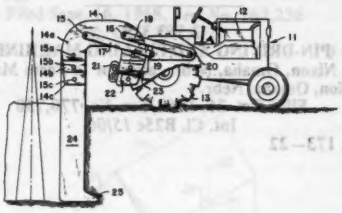
Howard L. Shatto, La Jolla, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Mar. 20, 1968, Ser. No. 714,659

Int. Cl. A01b *35/00;* E21c *37/20*

U.S. Cl. 172—40 3 Claims

A sonically-driven resonator of a resonant plow or trenching tool is formed so that at least its major dimension extends in a plane substantially parallel to the surface of the



earth formation being plowed and extends substantially along the direction of travel so as to reduce the vertical dimension thereof and any interference with overhead structures.

3,563,317

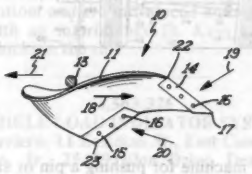
PLOW WITH OFFSET CUTTING BLADES

Kenneth F. Sprick, Zumbro Falls, Minn. 55991

Filed Sept. 19, 1967, Ser. No. 668,776

Int. Cl. A01b *15/04*

U.S. Cl. 172—754 1 Claim



A plow including a moldboard having a pair of plow blades secured to said moldboard and being disposed in forwardly converging angular relation with respect to each other. The reaction forces produced during the plowing operation by said plow blades being directed generally rearwardly and thereby eliminating all draft forces.

3,563,318

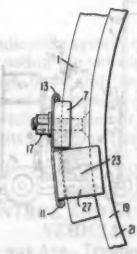
MOUNTING FOR CULTIVATING TOOL

Norman C. Eberhardt, Box 281, and Lee L. Ludwig, Box 242, Cut Bank, Mont.

Filed Apr. 5, 1968, Ser. No. 719,001

Int. Cl. A01b *39/22*

U.S. Cl. 172—750 4 Claims



A cultivating tool is mounted on a standard shank by means of a leaf spring having a portion spaced from one side of the shank and having a lower detent that snaps behind a sleeve that fits around the shank and is integral with the tool. A backstop is disposed between the leaf spring and the shank, the upper edge of the backstop cooperating with a second detent at the upper end of the leaf spring accurately to locate the leaf spring and the lower edge of the backstop

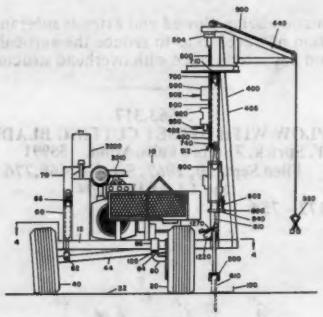
accurately locating the upper edge of the sleeve of the tool. The assembly of shank and backstop and leaf spring is detachably held together by a bolt passing through them.

3,563,319

PIN-DRIVING AND PULLING MACHINE

John F. Nixon, Omaha, Nebr., assignor to Form Master Corporation, Omaha, Nebr.

Filed Oct. 25, 1968, Ser. No. 770,730
Int. Cl. B25c 15/00
U.S. Cl. 173—22 4 Claims



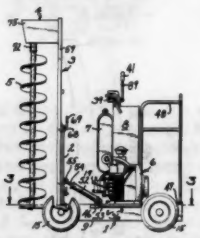
A pin-pushing machine for pushing a pin or stake into the ground comprising a frame with supporting wheels, a stake-engaging member, means for vertically pushing the stake-engaging member downwardly for pushing a stake into the ground.

3,563,320

MOBILE EARTH BORING MACHINE

Raymond E. von Ruden, Owatonna, Minn., assignor to General Equipment Co., Owatonna, Minn., a corporation of Minnesota

Filed Jan. 24, 1969, Ser. No. 793,852
Int. Cl. E21c 11/02
U.S. Cl. 173—27 2 Claims



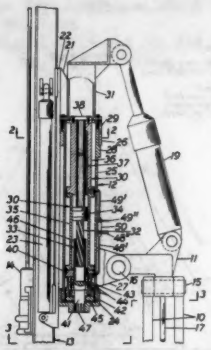
An earth boring machine having a power head including an auger drive shaft movable toward and away from the ground and having means for tilting the auger shaft for boring holes at various angles relative to the vertical. A single prime mover on the machine operates to impart movement thereto over the ground, tilt, raise, and lower the power head, and rotate the drive shaft, selectively, by means of transmission and control mechanisms.

3,563,321

DRILL BOOM STRUCTURE

Pieter Barendsen, Knivsta, Carl Olov Lindgren, Nacka; Erich Voldemar Kimber, and Karl Erik Qvarnstrom, Vendelso, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 10, 1969, Ser. No. 805,638
Claims priority, application Sweden, Mar. 12, 1968, 3236/68
Int. Cl. E21c 11/02
U.S. Cl. 173—43 7 Claims



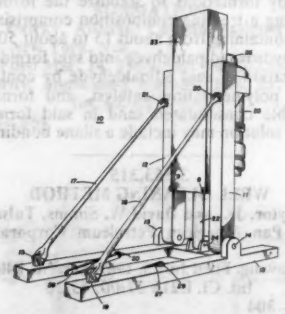
A feed bar for guiding a rock drill is swingably carried at the end of a swingably mounted boom. Besides being laterally and vertically swingable on the boom, the feed bar is swingable about an axis parallel with its longitudinal axis.

3,563,322

EARTH BORING MACHINE POSITIONING SYSTEM

James W. Young, Irving, Tex., and Ernest O. Kunkel, Nevada, Mo., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 30, 1969, Ser. No. 862,216
Int. Cl. E21c 9/00, 11/00; E21b 7/02
U.S. Cl. 175—57 8 Claims

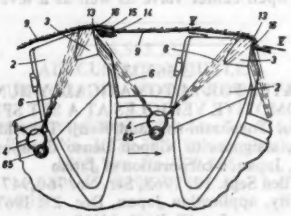


A system for erecting and changing the position of the drill column of an earth boring machine. The drill assembly is held in place by supports pivotally mounted upon a base. Brace means are attached to the supports which hold the drill assembly in position. Linkages may be attached to drill assembly and the brace means removed. Movement of the main thrust cylinder in the drill assembly causes the support means and consequently the drill column to change position. Support members may again be put in place to hold the drill column in position.

3,563,323
APPARATUS FOR BOREHOLE DRILLING
Howard Trethewen Edgecombe, Filton, England, assignor to Rolls-Royce Limited, Derby, England, a British Company
Filed Jan. 17, 1969, Ser. No. 791,913
Claims priority, application Great Britain, Jan. 19, 1968, 2915/68
Int. Cl. E21b *7/06*
U.S. Cl. 175—76 4 Claims

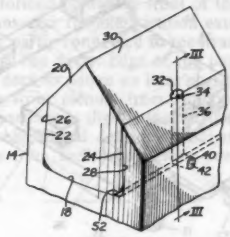
In deviation borehole drilling with a down-hole motor a plurality of flexible collars is disposed in the drill string between the main stand of weight collars and the deviation assembly. In this way the bending moments of the main stand of weight collars are not transmitted to the down-hole motor and better control of deviation is achieved.

3,563,324
MACHINE FOR CUTTING ROCK
Ernst Lauber, Thun, Switzerland, assignor to Atlas Copco MCT AB, Stockholm, Sweden
Filed July 9, 1969, Ser. No. 840,312
Claims priority, application Austria, July 16, 1968, A6836/68
Int. Cl. E21c *7/06, 7/08*
U.S. Cl. 175—393 12 Claims



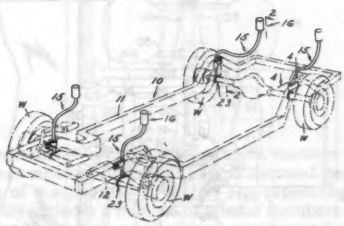
In a machine for cutting rock, a rotary cutter for cutting rock comprises a rotary cutter body having a forward end face and a plurality of cutting teeth mounted on said cutter body and spaced around the periphery thereof. Each of said cutting teeth has a cutting edge which is disposed radially beyond the periphery of said cutter body and axially beyond said forward end face. Each of said teeth also has a back surface adapted to define before said forward end face a clearance space with rock being cut by said cutting edge. A plurality of atomizing nozzles are mounted on said cutter body and have outlet ducts directed to said clearance spaces defined by said teeth when cutting in rock.

3,563,325
PERCUSSION BIT
Jack Miller, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Filed Sept. 16, 1968, Ser. No. 762,236
Int. Cl. E21c *13/01*
U.S. Cl. 175—410 7 Claims



The invention concerns a bit of the percussion type having a bit body with slots for receiving hard blocks, such as cemented tungsten carbide blocks. The slots taper outwardly toward the bottom and the blocks also taper outwardly toward the bottom and are introduced endwise into the slots, preferably with an interference fit. Keys are provided for locking the blocks in the slot.

3,563,326
VEHICLE LOAD INDICATOR SYSTEMS
Frank S. Guerriero, 11 Eastman St., East Concord, N.H., and John Quinn, Jr., 25459 Elon Drive, Dearborn Heights, Mich.
Filed Dec. 12, 1968, Ser. No. 783,179
Int. Cl. G01g *19/08*
U.S. Cl. 177—138 20 Claims

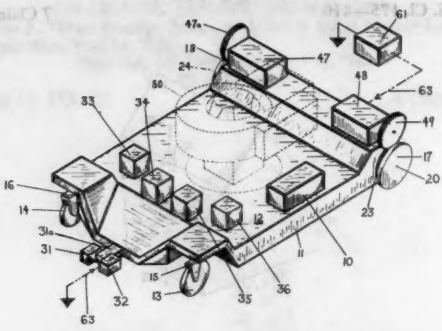


A vehicle load indicating system comprising a gauge body which is supported within the vehicle. A tubular member extends from the gauge body and has its lower end fixed adjacent a sprung mass of the vehicle. A rod member is slidably mounted within the tubular member and has its upper end in the gauge body and its lower end fixed to the unsprung mass.

3,563,327
ELECTRONIC CONTROL AND GUIDANCE SYSTEM FOR VEHICLES
David Mier, 447 Norway Ave., Trenton, N.J. 08629
Filed Nov. 20, 1968, Ser. No. 777,243
Int. Cl. B62d *11/04*
U.S. Cl. 180—65 4 Claims

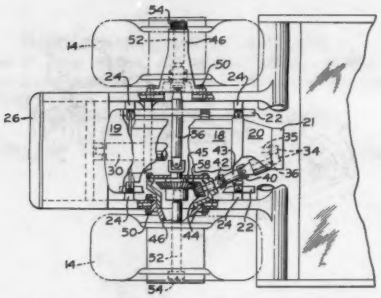
A vehicle control and guidance system for steering a vehicle along a predetermined path in response to signals picked up from a path defining conductor. The vehicle is driven by two independent electric motor driven wheels located on opposite sides of the vehicle. Each motor is controlled from a signal sensor on the opposite side of the vehicle from the motor being controlled so that a relatively strong signal from

one sensor will increase the speed of the motor on the opposite side of the vehicle. The control link between a sensor



and its corresponding motor is provided by a triac fired by a signal controlled variable time constant circuit.

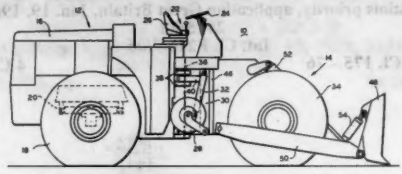
3,563,328
POWER PLANT FOR THE REAR WHEELS OF AN EARTHMOVING SCRAPER
Jacob W. Ahola, John J. Campbell, Vergil P. Hendrickson, and Alfred W. Sieving, Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill., a corporation of California
Filed Sept. 3, 1968, Ser. No. 757,019
Int. Cl. B60k *17/22*
U.S. Cl. 180—56 **3 Claims**



An arrangement of engine, transmission and drive coupling for the rear wheels of an earthmoving scraper which is of relatively light weight and is readily adaptable to scrapers of conventional design and readily removable and replaceable to facilitate replacement and repair of scraper parts disposed rearwardly of the scraper bowl.

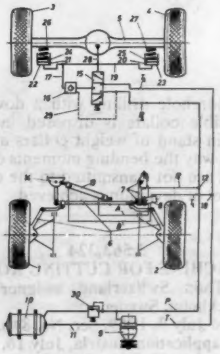
3,563,329
VEHICLE TRACTOR UNIT
Vincent Licari, Saint Joseph, Mich., assignor to Clark Equipment Company
Filed Mar. 22, 1968, Ser. No. 715,335
Int. Cl. B06d *7/00;* **B62d** *49/06, 53/04*
U.S. Cl. 180—12 **4 Claims**

A tractor unit for connection to an implement unit to form a complete vehicle, the tractor unit having a body portion, a pair of drive wheels, a connection portion pivotally connected to the body portion, and a pair of retractable auxiliary wheels mounted on the connection portion for use in maneu-



vering the tractor unit into position for coupling it to an implement unit.

3,563,330
HYDRAULIC CIRCUIT FOR MOTOR VEHICLES
Gunter Strauff, Kaarst, Germany, assignor to Langen & Co., Dusseldorf, Germany
Filed May 2, 1969, Ser. No. 821,268
Claims priority, application Germany, May 3, 1968, P 17 55 390.1
Int. Cl. B62d *5/06*
U.S. Cl. 180—79.2 **3 Claims**

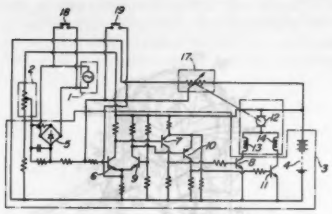


A hydraulic circuit for motor vehicles in which a single pumping means is used for supplying a servo-steering system including an open center valve as well as a level-regulating device.

3,563,331
APPARATUS FOR AUTOMATICALLY RUNNING AUTOMOTIVE VEHICLES AT A SET SPEED
Takaaki Kato, Toyohashi-shi, and Kenji Takeshita, Kariya-shi, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan, a corporation of Japan
Filed Sept. 19, 1968, Ser. No. 760,947
Claims priority, application Japan, Dec. 27, 1967, 42/83,648
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 **3 Claims**

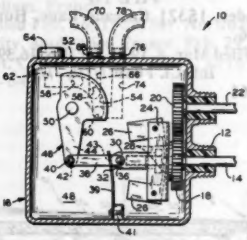
An apparatus for automatically running an automotive vehicle at a set speed, which is so designed that the speed of the vehicle running at a set speed can be accelerated or decelerated temporarily optionally without releasing the speed control system, said apparatus including two self-restoring switches located in the driver's cabin, one of said switches being inserted in an electric control circuit in such a manner that in a closed position of the switch a signal is given to the speed control system, which always causes the speed of the vehicle to be apparently lower than the set speed independently of the actual speed of the vehicle and the set speed, and another one of said switches being inserted in the electric control circuit in such a manner that in a

closed position of the switch a signal is given to the speed control system, which always causes the speed of the vehicle



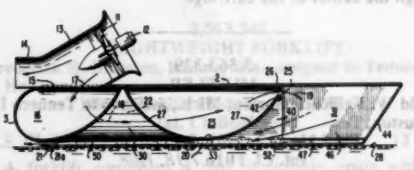
to be apparently higher than the set speed independently of the actual speed of the vehicle and the set speed.

3,563,332
UPPER SPEED LIMITING DEVICE
Harry D. Sturdy, Hagerstown, Ind., assignor to Dana Corporation, Toledo, Ohio
Filed Feb. 11, 1969, Ser. No. 798,285
Int. Cl. B60k *31/00*
U.S. Cl. 180—108 **12 Claims**



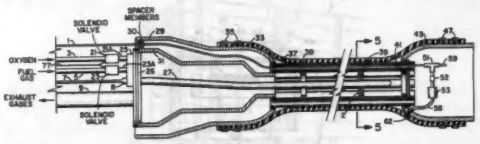
An upper speed control unit is provided which utilizes a modulated pressure to obtain throttle control. The speed sensing portion of the upper speed limiting unit is directly connected to the valving arrangement providing modulating pressure to a throttle actuating bellows. A spring means calibrated for the specific maximum speed acts against the speed sensing means to insure that the modulated pressure provided for the bellows activates the throttle to a closed position only upon the vehicle's reaching the maximum set speed.

3,563,333
AIR CUSHION VEHICLES
Melville W. Beardsley, 40 Windward Drive, Severna Park, Md.
Continuation-in-part of application Ser. No. 524,764, Feb. 3, 1966, now Patent No. 3,429,395. This application Nov. 27, 1968, Ser. No. 779,576
Int. Cl. B60v *1/04, 1/16*
U.S. Cl. 180—118 **22 Claims**



An air cushion vehicle having a deck and a plurality of flexible inflatable skirts depending downwardly from the deck and then inwardly and upwardly under the deck to enclose air conduit spaces supplied with air from a blower at the rear of the deck. Narrow elongated bottom skirts extend forwardly under the opposite sides of the vehicle where they are respectively secured to the lowermost portions of the inflatable skirts and held in proper vertical disposition by stiffener members secured to the inflatable skirts. The space under the vehicle deck below the reentrant portions of the inflatable skirts forms a rear lifting plenum, while a front lifting plenum is formed below the front of the deck by means including a transverse flexible partition extending under the deck and being partly connected to reentrant portions of the inflatable skirts. The upper edge of the partition terminates just below the deck to define an inlet port through which air passes into the front plenum from air conduits. The lower portion of the partition is slightly spaced above the lower side edges of the vehicle and defines a discharge port through which air exits from the front plenum rearwardly into the rear plenum.

3,563,334
SEISMIC SOURCE FOR USE WHILE SUBMERGED IN A LIQUID MEDIUM
Ed R. McCarter, Houston, Tex., assignor to Esso Production Research Company, a corporation of Delaware
Filed July 3, 1968, Ser. No. 742,387
Int. Cl. G01v *1/04*
U.S. Cl. 181—0.5 **9 Claims**

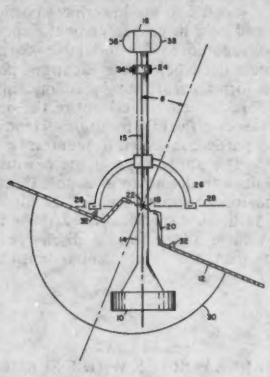


Seismic source for use in an aqueous medium utilizes an elastomer member supported by and disposed on at least a portion of a supporting structure. The supporting structure preferably includes a number of tubular members connected at the trailing end to a bell-shaped member and at a towing end to a pair of bell-shaped members positioned to discharge liquid from the medium into the tubular members. An explosively combustible fluid is introduced into the chamber formed by the elastomer member and the support structure through a mixing chamber and an elongated pipe that extends into the chamber. The explosive fluid is ignited in the mixing chamber. Pump means is provided for removing liquid from the interior of the chamber.

3,563,335
TUNED MECHANICAL STABILIZER
John F. Holmes, Andover, Mass., and Lawrence C. Frederick, Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.
Filed Mar. 17, 1969, Ser. No. 807,821
Int. Cl. B63b *45/08*
U.S. Cl. 181—0.5 **10 Claims**

There is herein disclosed a tuned mechanical stabilizer for suspension of transducers from ships. The transducer is affixed to one end of a shaft, the other end of which is provided with a fixed counterweight and an adjustable tuning

weight whereby the natural period of the transducer-stabilizer assembly may be tuned such as to substantially exceed

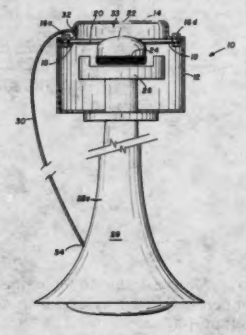


the roll-pitch period of the vessel and thereby isolate the transducer from vessel pitch and roll.

3,563,336
HORN SPEAKER

Francis A. Miller, Lawton, Okla., assignor to Ben O. Key, Lawton, Okla., a part interest

Filed May 23, 1969, Ser. No. 827,322
Int. Cl. G10k *13/00;* **H04r** *1/28*
U.S. Cl. 181—31 **6 Claims**



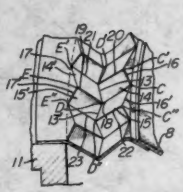
A horn speaker includes a speaker housing with a diaphragm suspended therein to form an air chamber in the rear of the housing. Conventional magnetic voice coil structure is responsive to input electrical signals for vibrating the diaphragm to generate acoustic energy. A speaker horn is connected to the speaker housing for transmitting the acoustic energy generated by the diaphragm. A tube communicates at one end with the air chamber and at the other end with the front portion of the speaker horn in order to equalize the pressure on opposite sides of the diaphragm. A rubber film is applied to the diaphragm suspension to increase the structural strength thereof.

3,563,337
ELECTROACOUSTIC TRANSDUCER

Sinichiro Kawamura, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 3, 1969, Ser. No. 803,890
Claims priority, application Japan, Mar. 6, 1968, 43/16940
Int. Cl. G10k *13/00;* **H04r** *7/00*
U.S. Cl. 181—32 **3 Claims**

An electroacoustic transducer having an edge of special shape supporting a diaphragm, which edge is provided with a succession of pleats disposed along the circumferential direction of the diaphragm and a multiplicity of pleats running in the radial direction of the diaphragm. The pleats

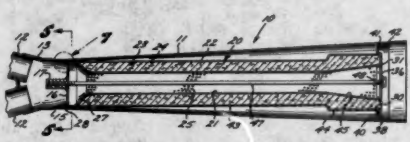


of the edge make a folding movement in response to movement of the diaphragm so that the edge expands and contracts in its circumferential direction thereby to follow the movement of the diaphragm.

3,563,338
REMOVABLE MUFFLER CARTRIDGE PARTICULARLY ADAPTED FOR A FORWARDLY TAPERING EXHAUST PIPE TIP

Richard L. Rader, 15321 Cascade Lane, Huntington Beach, Calif. 92646

Filed Mar. 4, 1970, Ser. No. 16,394
Int. Cl. F01n *1/10, 7/18*
U.S. Cl. 181—61 **13 Claims**



A removable muffler cartridge in combination with a forwardly tapering exhaust pipe tip which has a rearwardly facing V-shaped cross section sealing ring located at the forward end of the cartridge, said cartridge having an inner tube concentrically located within an outer tube to form a muffler chamber therebetween with muffler material therein, said inner tube having a plurality of holes therethrough communicating the muffler chamber with the interior of the inner tube and having a forwardly tapering rear section, said outer tube having a cylindrical front section and a cylindrical rear section which is substantially larger than said front section, said cartridge being provided with radially extending structure at its rear end to index the cartridge concentrically with the exhaust pipe tip, and being removably held in engagement with said V-shaped sealing ring by a bolt extending through the center of the cartridge.

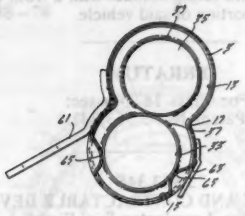
3,563,339
MUFFLER

Donald W. Kellicutt, Horton, Mich., assignor to Tenneco Inc., Houston, Tex.

Filed May 12, 1969, Ser. No. 823,792
Int. Cl. F01n *7/18, 1/08*
U.S. Cl. 181—61 **9 Claims**

A muffler shell of originally circular cross section is shaped into a figure eight cross section and subdivided into chambers by transverse partitions, one of the chambers acting with

perforated areas in a gas flow tube to attenuate relatively low frequencies and another of the chambers containing overlapping perforated tubes defining a reverse flow or triflow path for gas passing through it.

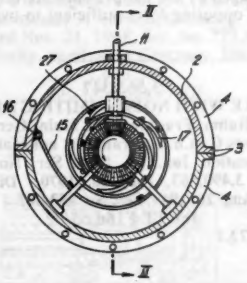


3,563,340

RETRACTABLE SILENCING FLAPS FOR JET ENGINE INTAKE

Louis Duthion, Paris, France, assignor to Bertin & Cie, Plaisir, Yvelines, France

Filed Feb. 26, 1969, Ser. No. 802,397
Claims priority, application France, Feb. 29, 1968, 141,781
Int. Cl. B64d *33/02, 33/06;* **F01n** *1/12*
U.S. Cl. 181—64 **19 Claims**



The invention relates to a silencing system for pipes which carry fluids, more particularly fluid inlet pipes for turbojet engines, and is characterized in that the silencing system comprises longitudinal soundproofed flaps so arranged that they can either be extended in order to divide the pipe into soundproofed unit ducts or retracted into a reduced volume.

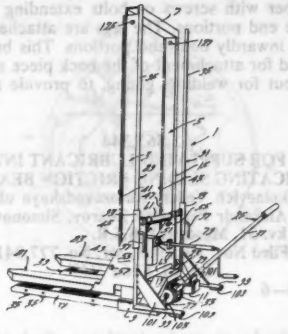
3,563,341

LIGHTWEIGHT FORKLIFT

Frederick H. Bultman, Racine, Wis., assignor to Tenneco Inc., Houston, Tex.

Filed June 20, 1968, Ser. No. 738,623
Int. Cl. B66b *9/20*
U.S. Cl. 187—9 **12 Claims**

A forklift comprises a pair of upright posts which are secured through rack and gear means to a carriage that moves longitudinally of the posts and includes a pair of arms for positioning beneath a large load to be lifted. The arms on the carriage alternate with a pair of arms attached to the bottoms of the posts, and movable between positions beneath the lift arms and on opposite sides of the posts, as the base means in transmitting the load on the lift into the floor. A stabilizer structure is provided to prevent tipping of the lift.

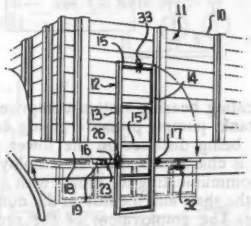


3,563,342

TRUCK LADDER

Elvie Lasiter, P.O. Box 9, Caldwell, Kans. 67022

Filed Oct. 24, 1969, Ser. No. 869,023
Int. Cl. E06c *5/04*
U.S. Cl. 182—97 **6 Claims**



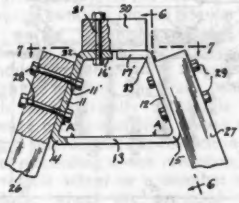
The invention consists of a metal ladder to be used on large trucks of the open bed type to permit a person to climb up the ladder to look inside the open bed of the truck, said ladder being attached to the truck bed in such manner that it can be swung into position under the truck bed when not in use and can be pulled out, swung up and attached to the side of the truck for use.

3,563,343

BRACKET FOR USE WITH SAWHORSES AND THE LIKE

Hartzell M. Kramm, 1111 Nowland Ave., Peoria, Ill.

Filed July 9, 1969, Ser. No. 840,168
Int. Cl. F16m *11/00;* **E04g** *1/32*
U.S. Cl. 182—224 **4 Claims**



Brackets for use in the assembly of sawhorses, barricades, road blocks, trestles and the like are formed of stacked metal

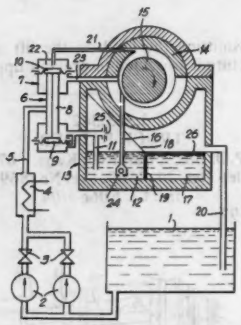
straps having end portions bent upwardly and inwardly from an intermediate bottom portion and with the ends of the end portion bent up either vertically or horizontally inwardly toward one another and so as to support a back piece or cross member with screws or bolts extending through the holes of the end portions. The legs are attached to the upwardly and inwardly bent end portions. This bracket is not only adapted for attachment of the back piece and leg piece by screws but for welding, gluing, to provide a permanent structure.

3,563,344

DEVICE FOR SUPPLYING LUBRICANT INTO SELF-LUBRICATING SLIDING FRICTION BEARINGS

Vladimir Nikolaevich Veller, Autozavodskaya ulitsa, 9/1, kv. 137, and Alexandr Petrovich Zharov, Simonovsky val. 22, korpus 2, kv. 31, Moscow, U.S.S.R.

Filed Nov. 19, 1968, Ser. No. 777,041
Int. Cl. F16n 7/40
U.S. Cl. 184—6 **5 Claims**



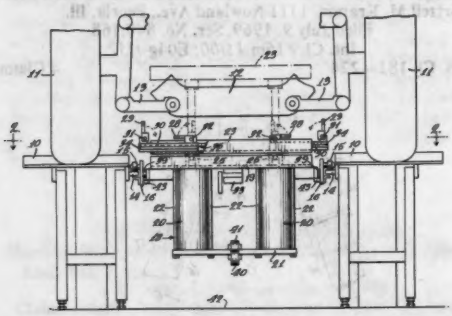
A self-lubricating bearing system comprises a series-connected drain tank, pumps, pressure piping and a reservoir. Said reservoir being disposed in the lower portion of the bearing casing is characterized by the employment of an additional duct communicating the piping with a space between the journal of the shaft and the hub in the nonloaded portion of the bearing. The employment of the present invention makes it possible to completely eliminate the danger of the breakdown of the bearing and the unit caused by the stoppage of the supply of lubricant into the bearing.

3,563,345

LIFTING DEVICE

Charles W. MacMillan and Milton A. Wertheimer, Rock Island, Ill., assignors to Applied Power Industries, Inc.

Filed Nov. 12, 1968, Ser. No. 774,932
Int. Cl. B66f 7/00
U.S. Cl. 187—8.43 **5 Claims**



The combination with a drive-on type motor vehicle lift having spaced runways, of means for lifting the front end of a motor vehicle and for supporting it free of the front wheels thereof to allow inspection and servicing of the vehicle front end, comprising a front end lift assembly extending between said runways, rollers on said assembly supported on rails carried on the adjacent edges of said runways to permit longitudinal travel of said assembly as a unit, and means for elevating said assembly into lifting contact with a front end underside configuration portion of said vehicle.

ERRATUM

For Class 187—9 see:
Patent No. 3,563,341

3,563,346

EXTENSIBLE AND CONTRACTABLE DEVICES

Wilfred N. Bainbridge, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, Warwickshire, England

Filed Feb. 3, 1969, Ser. No. 796,050
Int. Cl. F16d 63/00
U.S. Cl. 188—67 **6 Claims**

A linearly extensible and contractible device comprising a plunger component slidable in a cylinder component has the plunger urged in one direction in the cylinder by compressed gas, and mechanical locking means operative to hold the plunger against movement in the other direction and normally held engaged by the gas pressure are released by exerting thereon an opposing force sufficient to overcome the gas pressure.

3,563,347

DISK BRAKE WITH NOISE-LIMITING BRAKESHOE

Heinz Gunter Hahm, Frankfurt am Main, Germany, assignor to Alfred Teves G.m.b.H., Frankfurt am Main, Germany

Original application Jan. 10, 1968, Ser. No. 696,847, now Patent No. 3,490,563, Jan. 20, 1970. Divided and this application Aug. 26, 1969, Ser. No. 853,047
Int. Cl. F16d 65/02
U.S. Cl. 188—73.1 **8 Claims**

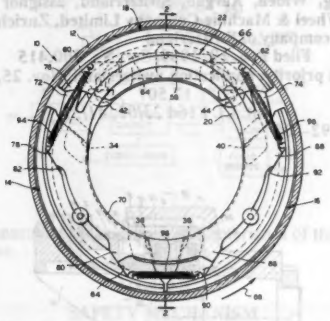
A brakeshoe adapted to limit noise generated by a disc brake wherein an intermediate plate, interposed between the backing plate of the brakeshoe and the piston, is affixed to the backing plate and provides force transmission between the piston and the backing plate which is offcenter from the centrum of the disc-engaging surface of the brake lining, the force-transmitting portion consisting at least in part of a thermal insulator.

3,563,348

INTERNALLY EXPANDING BRAKE WITH PILOT MECHANISM

Barry L. Frost, Jackson, Mich., assignor to Clark Equipment Company, a corporation of Delaware

Filed Apr. 30, 1969, Ser. No. 820,399
Int. Cl. F16d *51/70*
U.S. Cl. 188—78 **2 Claims**



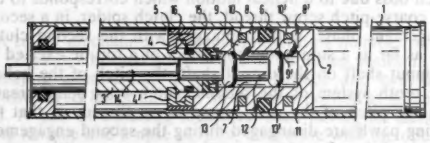
An internal expanding shoe brake having an energizer shoe movable radially and circumferentially. Circumferential movement of the energizer shoe rotates an actuator ring which causes radial and circumferential movement of two main brake shoes, thereby applying the brake.

3,563,349

BLOCKABLE DEVICE FOR THE STEPLESS ADJUSTMENT OF FLAPS

Rudolf Spieth, Plochingerstrasse 156, Esslingen, and Erich Blazek, Lindenstrasse 3, Altbach, Germany

Filed Nov. 21, 1968, Ser. No. 777,667
Claims priority, application Germany, Jan. 24, 1968, 1,675,367
Int. Cl. B65h *59/10*
U.S. Cl. 188—96 **9 Claims**



An improved piston-cylinder arrangement, more particularly for the stepless adjustment of table tops, chairs and the like, comprising a piston rod with a piston slidingly mounted in a cylinder containing a pressurized gas, wherein the piston is sealed against the inner cylinder wall by means of an annular seal which is bridged by a continuous flow channel inside the piston, the outlets of which are each closed on both sides of the said annular seal by separate annular-spring biased valves which can be opened by externally actuable means.

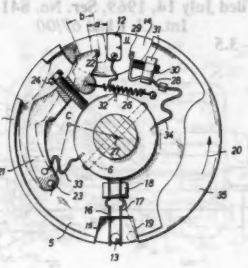
3,563,350

ANTISKID BRAKE CONTROL SYSTEM

Heinz Leiber, Leimen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Feb. 4, 1969, Ser. No. 796,337
Int. Cl. B60t *8/04*
U.S. Cl. 188—181 **9 Claims**

An antiskid brake control system for preventing the wheels of a braked vehicle from locking. The system is of the type which produces an electrical signal in dependence upon the rotational deceleration of the wheels of the vehicle and reduces the braking force applied to the decelerating wheel or wheels upon occurrence of this signal. According to the invention, this antiskid brake control system is provided with means for inhibiting the electrical signal when the rotational



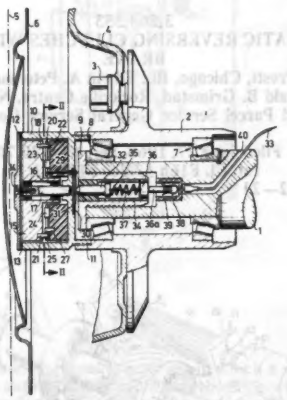
speed of the brake-regulated wheel or wheels exceeds a prescribed value. This inhibiting or blocking means renders aperiodic the operation of the antiskid brake control system.

3,563,351

ANTISKID BRAKE CONTROL APPARATUS FOR SENSING CHANGES IN THE ABSOLUTE ROTATIONAL SPEED OF A VEHICLE WHEEL

Heinz Leiber, Im Enklert, and Heinz Wehde, Heidelberg, Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed Apr. 18, 1969, Ser. No. 817,340
Claims priority, application Germany, Apr. 20, 1968, 1,755,280
Int. Cl. B60t *8/16*
U.S. Cl. 188—181 **21 Claims**

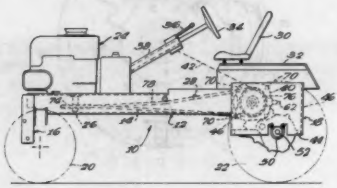


An antiskid brake control system having means for sensing changes in the absolute rotational speed of a vehicle wheel. The sensing means includes a hermetically sealed housing, an inertial mass arranged within the housing and rotatable relative to the housing within a limited angular range, an electrical signaling device responsive to the relative rotation between the inertial mass and the housing and at least one electrical conductor connected to the signaling device and passing through the housing. The brake control system is also provided with an electrically actuatable device for controlling the brake pressure applied to the sensed wheel and an electrical line interconnecting the sensing means with this control device. According to the invention, the sensor housing and the vehicle wheel or a member rigidly connected with the vehicle wheel are provided with means for detachably coupling these two parts together. Contact elements are also provided, beneath the side of the sensor housing that faces the wheel, to detachably connect the electrical line to the electrical conductor.

3,563,352
HYDROSTATIC TRANSMISSION WITH FREEWHEEL DRIVE

Paul H. Stibbe, Neenah, Wis., assignor to J. I. Case Company, a corporation of Wisconsin

Filed July 14, 1969, Ser. No. 841,353
Int. Cl. F16d *67/00*
U.S. Cl. 192—3.5 **6 Claims**

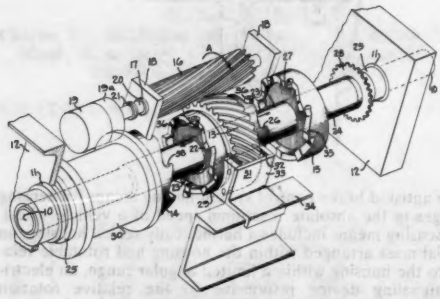


The drive system of the present application has particular utility in connection with a small vehicle, such as a garden tractor, and the propelling wheels of the vehicle are powered through a system including a belt-driven hydrostatic transmission and a gear reducer, with one-way clutch means being connected between the pulley drive system and the input shaft of the hydrostatic transmission. The one-way clutch means allows the hydrostatic transmission to transmit power to the propelling means in forward and reverse directions when the prime mover is actuated, and when the prime mover is not actuated, the one-way clutch means allows the vehicle to be moved when the control of the transmission is placed in forward or reverse directions, since the input shaft of the transmission is free to rotate in one direction relative to the belt drive system.

3,563,353
AUTOMATIC REVERSING CLUTCHES WITH PILOT BRAKE

Roy F. LoPresti, Chicago, Ill.; Edwin A. Peterson, Manhasset, and Oswald B. Grimstad, Rockville Centre, N.Y., assignors to United Parcel Service General Service Co., New York, N.Y.

Filed June 27, 1968, Ser. No. 740,708
Int. Cl. F16h *57/10;* **F16d** *43/30*
U.S. Cl. 192—21 **1 Claim**

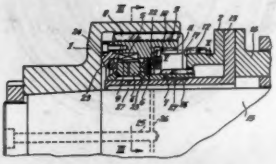


Torque transmitting apparatus having two intermeshed helical gears which employs the axial thrust of the helical gears to shift the driven gear longitudinally along its axis, in a direction dependent upon the direction of rotation of the driving gear, so as to effect a clutching action between the driven gear and alternately one of two output members disposed on either side of the driven helical gear. Apparatus for synchronizing a positive engaging ratchet tooth clutch including a cam surface on one of the clutch members and a cam follower on the other clutch member to cam the moveable clutch member longitudinally toward the stationary clutch member while maintaining the ratchet teeth out of engagement one with another until the moveable clutch member has moved through its full longitudinal travel and into complete engagement with the other clutch member.

3,563,354
AUTOMATICALLY ENGAGING AND DISENGAGING DOG CLUTCH

Hans Sigg, Widen, Aargau, Switzerland, assignor to Maag Gear Wheel & Machine Company Limited, Zurich, Switzerland, a company of Switzerland

Filed Feb. 19, 1969, Ser. No. 800,415
Claims priority, application Switzerland, Nov. 25, 1968, 17,507
Int. Cl. F16d *23/02, 41/22*
U.S. Cl. 192—35 **3 Claims**



In an automatically engaging and disengaging dog clutch between an input shaft and an output shaft, comprising a first straight-toothed clutch boss, a second helical-tooth clutch boss, an axially slidable clutch spider and a synchronizing sleeve which is retained against axial movement in the clutch spider but is rotatable therein and is connected by screw-threading means of coarse pitch to the second clutch boss, said clutch spider being in constant mesh by way of straight-tooth gearing with the first clutch boss and being adapted for optional engagement with and disengagement from the second clutch boss, automatic clutch engagement being obtained by virtue of the relative engagement phase between the clutch spider and the second clutch boss being sensed by pawls which are adapted to mesh with a ratchet tooth system of the synchronizing sleeve, the clutch spider in a first engagement phase being partially engaged with the second clutch boss due to a helical motion which corresponds to the said coarse-pitch screw thread, the clutch spider, in a second engagement phase, is fully engaged with the second clutch boss as far as a stop under the effect of a torque exerted by the input shaft on the output shaft, the pitch of the helical gear tooth system of the second clutch boss being greater than the pitch of the said coarse screw thread, so that the sensing pawls are disengaged during the second engagement phase and therefore do not participate in transmitting power when the clutch is engaged.

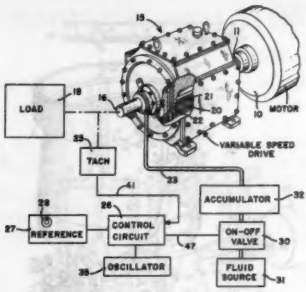
3,563,355
CONTROL SYSTEM FOR VARIABLE SPEED DRIVE

Raymond E. Goodson, West Lafayette, and Dennis Dobrinich and Lindell R. Riddle, New Castle, Ind., assignors to Force Control Industries, Inc., Fairfield, Ohio

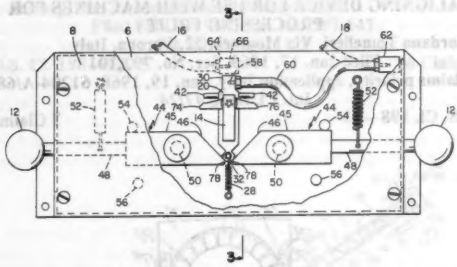
Filed Mar. 19, 1969, Ser. No. 808,501
Int. Cl. F16d *43/24*
U.S. Cl. 192—104 **7 Claims**

The control system for maintaining the output speed of a fluid control variable speed drive at a preselected magnitude includes an on-off control valve to supply control fluid to the drive, a tachometer to sense the output speed of the drive, circuit means for comparing the actual output speed with the desired output speed, and means for supplying current to the on-off valve to adjust the fluid to the drive so that the desired output speed is obtained. The control circuit to the on-off valve includes an oscillator, the output wave form of which is superimposed upon a DC voltage representing the difference between desired speed and actual speed. For small error signals, the on-off valve is periodically operated exclusively by that portion of the oscillator output signal which exceeds

the threshold voltage of the on-off valve solenoid. The shape of the oscillator wave form may be selected to compensate for nonlinearity in the response characteristics of the variable speed drive.



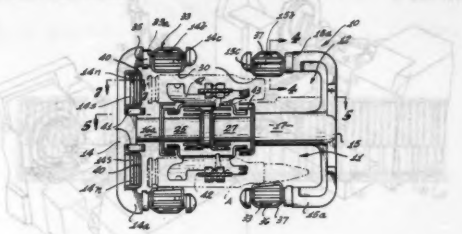
3,563,356
SAFETY MECHANISM
Leon A. Glickman, Westwood, Mass., assignor to Keystone Manufacturing Corporation, Boston, Mass.
Filed Apr. 1, 1969, Ser. No. 812,026
Int. Cl. F16d *9/00*
U.S. Cl. 192—131 **12 Claims**



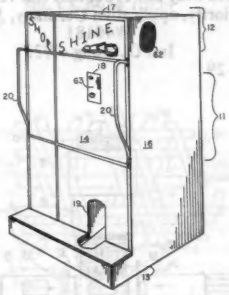
A safety mechanism includes an operating member movable between a normal position and an actuating position. The operating member has a camming surface and two latch recesses at its lower end and an actuator portion at its upper end. A pair of camming members, each having an inclined ramp surface and a nose portion, cooperate with the operating member. A manual control is connected to each camming member. Substantially simultaneous movement of both manual controls causes the ramp surfaces to impart a balanced camming action on the operating member to move the actuator portion to an actuating position. Should the movement of one inclined surface exceed the movement of the other surface by a predetermined amount, its movable portion and a corresponding recess will be latched, preventing movement of said actuator portion to the actuating position. A manually operable reset structure is provided to release the latched members.

3,563,357
ARTICLE CONVEYING CHUTE
William F. West, Sunland, Calif., assignor to Harvard Industries, Inc., Farmingdale, N.J., a corporation of Delaware
Filed Nov. 18, 1968, Ser. No. 776,665
Int. Cl. B65g *11/10*
U.S. Cl. 193—25 **19 Claims**

A flexible conveying chute particularly adapted to convey ammunition to and from an automatic weapon is designed to provide forward and return paths for an endless belt. The chute itself is made of modular links that provide a multiplicity of guide surfaces which adapt the chute to handling the belt whether empty or carrying live or spent ammunition. The links are molded plastic with metal guide surfaces employing a maximum of duplicate parts which make for ease of assembly and disassembly of both the links and the chute.



3,563,358
COIN OPERATED SHOE SHINING MACHINE
Carl J. Lindeberg, 4604 Pastel Place, Austin, Tex. 78745
Filed Mar. 3, 1969, Ser. No. 803,830
Int. Cl. G07f *13/00*
U.S. Cl. 194—13 **2 Claims**

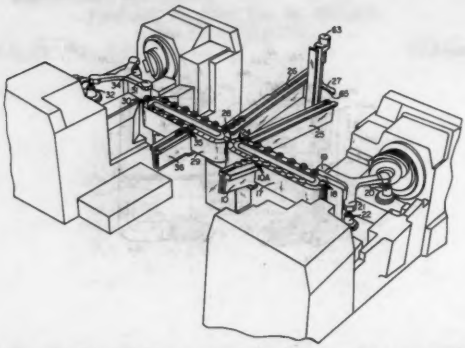


Coin operated shoe shining machine in which a self shining liquid spray is automatically applied to the shoe while on the customer's feet but with the spraying and shining operation being accomplished within an enclosed housing structure.

3,563,359
AUTOMATIC WORKPIECE TRANSFER AND STORAGE MECHANISM
Ernst J. Hunkeler, Fairport, and Ralph E. Klubertanz, Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y., a corporation of New York
Filed Apr. 1, 1969, Ser. No. 812,287
Int. Cl. B23p *23/04*; **B23q** *5/22*
U.S. Cl. 198—19 **9 Claims**

A transfer mechanism for delivering and receiving pinion workpieces to and from a pair of double-station bevel gear cutting machines in timed relation to their operation. The mechanism also includes storage bank means in which partially-processed workpieces may be accumulated, thereby permitting the double-roughing machine to continue operation when the double-finishing machine must be temporarily

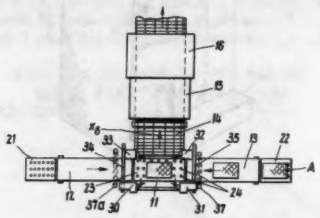
shutdown for cutter replacement, daily maintenance, etc., and similarly providing a continuing supply of workpieces to the double-finishing machine when the double-roughing machine is temporarily shutdown.



3,563,360
APPARATUS FOR FEEDING ARTICLES TO BE PACKAGED, PARTICULARLY JOURNALS, NEWSPAPERS AND THE LIKE, TO PACKAGING APPLIANCES

August Wickersheim, Industriestrasse 4, Egenbuttel, Hamburg, Germany

Filed May 23, 1968, Ser. No. 731,585
Claims priority, application Germany, July 18, 1967, W40181
Int. Cl. B65g 47/22
U.S. Cl. 198—29 7 Claims



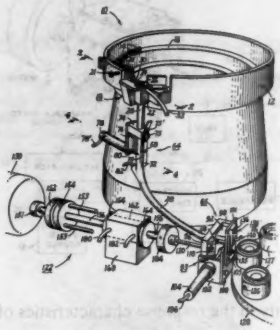
The invention relates to a means for feeding articles onto a trueing table. In the vicinity of the table there is provided means including gripper arms operatively first to position the articles on the table and then secondly to move the article off from the table. The gripper arms are connected to a control means controlling the individual working movements of the gripper arms.

3,563,361
SET SCREW FEEDING, ORIENTING AND DRIVING SYSTEM

Miroslav J. Piroutek, Stamford, Conn., assignor to Self-Matic Valves Corporation, Stamford, Conn.

Filed June 4, 1968, Ser. No. 734,463
Int. Cl. B65g 47/24
U.S. Cl. 198—33 3 Claims

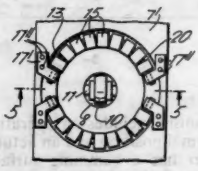
The disclosed system includes a vibratory feeder feeding headless set screws successively to an orienting apparatus, which uses an air jet to properly orient the set screws or has a passageway admitting only properly oriented set screws. An escapement mechanism in a delivery of set screws with operation of a shuttle mechanism in positioning each to be driven into a part by a driver mechanism. This mechanism includes an air cylinder and piston for reciprocating a rotating driver element engaging each set screw.



3,563,362
ALIGNING DEVICE FOR USE WITH MACHINES FOR PROCESSING FRUIT

Giordano Tomelleri, Via Montorio 22, Verona, Italy

Filed Jan. 17, 1969, Ser. No. 792,101
Claims priority, application Italy, Jan. 19, 1968, 61204-A/68
Int. Cl. B65g 47/24
U.S. Cl. 198—33 7 Claims



This invention relates to a device which helps to mechanically align fruit of substantially round or oval shape and which is to be stoned and/or cored and/or cut into two or more sections in a fruit processing machine, the device comprising a spindle, at least one roller freely rotatably mounted on said spindle for supporting the fruit when it is rotated in a supporting cup of the machine.

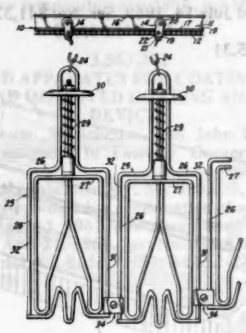
3,563,363
CONVEYOR SYSTEM

Grover S. Harben, Gainesville, and Ernest E. Lewis, Flowery Branch, Ga., assignors to Gainesville Machine Company, Inc., Gainesville, Ga., a corporation of Georgia

Filed Jan. 3, 1968, Ser. No. 695,449
Int. Cl. B65g 17/20
U.S. Cl. 198—177 1 Claim

A conveyor system of the type utilized in a poultry-processing plant, including an elevated conveyor track, a chain movable along the conveyor track, a series of spaced rollers movable with the chain along the conveyor track, a plurality of shackles suspended below the conveyor track and

connected to the rollers, and a connecting member fastened between adjacent ones of the shackles at a point spaced



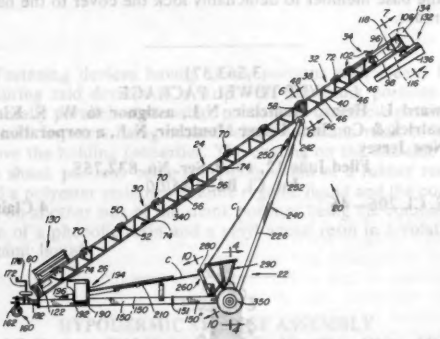
below the conveyor track for maintaining the adjacent ones of the shackles in spaced relationship.

3,563,364

PORTABLE CONVEYOR

Charles J. Arndt, Valley View, Glen Ellyn, and Roy F. Lo Presti, Chicago, Ill., assignors to Harsco Corporation, Harrisburg, Pa., a corporation of Pennsylvania

Filed Feb. 7, 1969, Ser. No. 797,647
Int. Cl. B65g *21/02*
U.S. Cl. 198—120.5 16 Claims



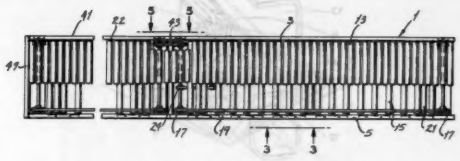
In an improved conveyor of the type including an elongated conveyor-carrying boom pivotally mounted at one end to a wheeled supporting frame, with the other end of the boom being supported by an arm pivotally mounted adjacent the other end of the frame, with a sheave-carrying arm pivotally mounted adjacent the said other end of the support frame, and with a cable passing over the sheave and connected at one end to the support arm and at its other end to an hydraulic cylinder, the sheave arm and support arm are positioned such that the ratio of the reaction force acting on the support arm to the moment arm lying between the support arm pivot point and the point the cable passes over the sheave remains substantially equal for any given position of the conveyor boom. Such a conveyor additionally preferably includes means for adjusting the length of the aforesaid moment arm such that the same structural elements may be employed for booms of varying length.

3,563,365

ACCUMULATING CONVEYOR

Henry Thomas Loberg, 2109 Mockingbird Lane, Jonesboro, Ark. 72401

Filed June 10, 1968, Ser. No. 735,651
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 3 Claims



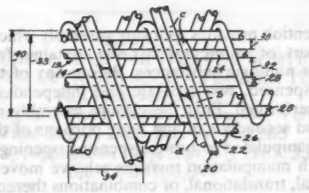
An accumulating conveyor supports transport rollers on a pair of channels with snub rollers below. Adjustable spring means mount the snub rollers. An endless V-belt is trained over the snub rollers and under the transport rollers to be carried by the snub rollers and to actuate the transport rollers. The conveyor is made in sections so that several of these can be attached together, the end transport rollers joined together, and a plurality of units run from a single motor.

3,563,366

COMPOUND ROD-REINFORCED BELT

Ronald G. Daringer, Cambridge, Md., assignor to Cambridge Wire Cloth Company, Cambridge, Md., a corporation of Maryland

Filed Mar. 20, 1969, Ser. No. 808,970
Int. Cl. B65g *15/54*
U.S. Cl. 198—193 14 Claims



A compound rod-reinforced belt in which spirals of one twist are interwoven and rods are inserted at least through each interlocked juncture of helix vertices, there being at least three rods passing transversely through each spiral with the spacing between two adjacent rods being approximately one-half the spacing between all other adjacent rods.

3,563,367

ATTACHMENT DEVICES FOR SCRAPER CHAIN CONVEYORS

Oswald Breuer, Dortmund-Husen; Alois Hauschopp, Langern, and Bernd Steinkuhl, Lunen, Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany, a body corporate of Germany

Filed May 14, 1969, Ser. No. 824,618
Claims priority, application Germany, Jan. 15, 1969, 1,901,773
Int. Cl. B65g *15/60*; F16b *1/00, 19/00*
U.S. Cl. 198—204 9 Claims

An attachment device having a plate securable to a side of a scraper chain conveyor having outwardly projecting pins which pass through apertures in said plate. Disc elements are placed onto the pins to lie against the plate and a locking rod is passed through diametric bores in the pins at the side of the elements remote from the plate. The elements have

wedge surfaces, preferably helical, on their faces adjacent the locking rod so that upon rotation of one or both discs the

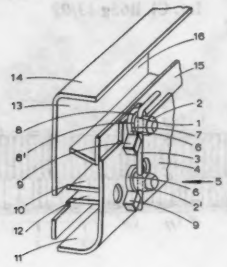
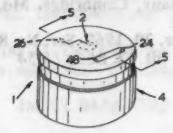


plate will be urged inwardly and axially of the pins and locked in position.

3,563,368
CLOSURE ASSEMBLY FOR CONTAINERS

Wilfred L. MCHugh, 2501 Carleton St., Calgary, Alberta, Canada

Filed Feb. 7, 1969, Ser. No. 797,518
Claims priority, application Canada, Feb. 8, 1968, 11,957
Int. Cl. B65d *83/04, 43/16*
U.S. Cl. 206—42 **11 Claims**

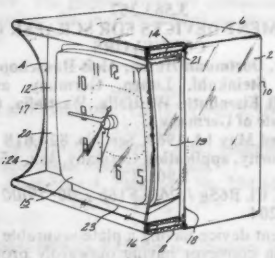


The invention provides a closure assembly which is either a separate part, or an integral part of a container for medicinal or toxic or nontoxic substances. Before any of the contents can be dispensed, two separate and independent functions must be performed. First the closure assembly must be unlocked, and secondly cap and body portions of the assembly must be manipulated to bring dispensing openings into alignment. Such manipulation involves relative movement which is rotational, translational, or combinations thereof.

3,563,369
DISPLAY CARTON FOR A CLOCK

Robert B. Aldrich, Wellesley Hills, Mass.

Filed Feb. 28, 1969, Ser. No. 803,313
Int. Cl. B65d *5/50, 65/16*
U.S. Cl. 206—45.14 **3 Claims**

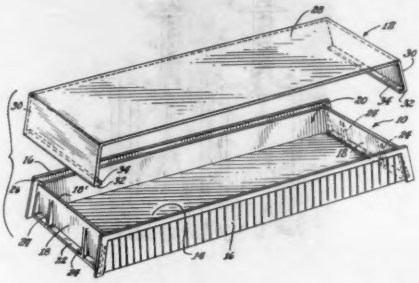


A display carton for a clock or other article of merchandise wherein a single piece of paperboard is formed to provide top, bottom, side and rear walls.

3,563,370
DISPLAY BOXES

Morris Nozette, 7074 N. Western Ave., Chicago, Ill. 60645, and Robert Podall, Highland Park, Ill.; said Podall assignor to said Nozette

Filed July 14, 1969, Ser. No. 841,323
Int. Cl. B65d *25/00*
U.S. Cl. 206—45.31 **7 Claims**



A display box molded of a plastic material comprising a base member and a removable cover, with the base member having a bottom, spaced sides, end walls, and an open top. The bottom extends outwardly of the end walls so that it forms a lip exteriorly of the end walls adjacent the bottom of the end walls. Each end wall has one or more ribs which extend to the bottom lip which serve as guide members. The removable cover has a top wall and spaced downwardly extending end walls which have an inwardly extending lip adjacent the bottom. The cover is adapted to be positioned on the base member so that the top wall of the cover extends over the top of the base member and the end walls of the cover are adjacent the exterior of the end walls of the base member, with the lips of the end walls of the cover riding over the rib or ribs on the end walls of the base member as same is moved into position and the lips engage the bottom of the base member to detachably lock the cover to the base member.

3,563,371
WET TOWEL PACKAGE

Edward L. Heinz, Montclair, N.J., assignor to W. S. Kirkpatrick & Co., Inc., Upper Montclair, N.J., a corporation of New Jersey

Filed June 12, 1969, Ser. No. 832,755
Int. Cl. B65d *85/00*
U.S. Cl. 206—46 **4 Claims**

A finely perforated sheet of nonwoven fabric composed of nylon and cotton having a width and length of the order of 8 and 11 inches, respectively, is folded six times into superposed plies that are impregnated with a scented liquid, for example, water and lime fragrance, and enclosed between

heat-sealed sheets each of which comprises an innermost layer of vinyl compound, on one side of a layer of aluminum on the other side of which is a coating of polyethylene which has an outer layer of cellophane, the resulting packet being capable of withstanding high temperatures to 420° F. for 20 minutes and low temperatures to 38° F. for 10 minutes.

3,563,372

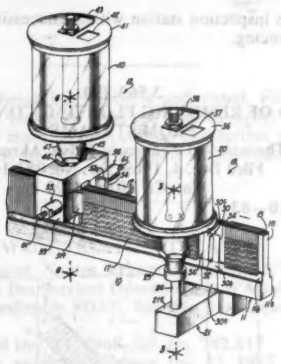
METHOD AND APPARATUS FOR COATING FASTENING DEVICES, AND IMPROVED COATING AND FASTENING DEVICES

William H. Baum, Westchester, and John Mostetich, Elmhurst, Ill., assignors to Fastener Corporation, Franklin Park, Ill.

Continuation of application Ser. No. 650,135, June 29, 1967, now abandoned , which is a continuation of application Ser. No. 187,372, Apr. 13, 1962, now abandoned. This application Apr. 21, 1969, Ser. No. 818,856

Int. Cl. B65d *71/00*; **B44d** *1/42*

U.S. Cl. 206—56 **1 Claim**



Fastening devices having shank portions with means for securing said devices in a strip with the shank portions in generally parallel relationship, portions of the shank portions of said fasteners being coated with a synthetic resin to improve the holding properties. The coating on the one side of the shank portions being the combination of a rubber resin and a polyester resin in a volatile organic liquid and the coating on another side of the shank portions being the combination of a phenolic resin and a vinyl acetal resin in a volatile organic liquid.

3,563,373

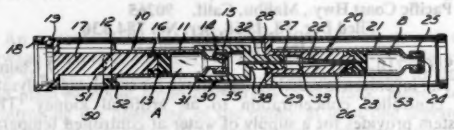
HYPODERMIC SYRINGE ASSEMBLY

Paul E. Paulson, 2015 Wales Road NE., Massillon, Ohio 44646

Filed Oct. 6, 1967, Ser. No. 673,342

Int. Cl. A61m *5/22*; **B65d** *77/08*

U.S. Cl. 206—63.2 **6 Claims**



Prefilled cartridges assembled and packaged for mixing of dual ingredient hypodermic injections immediately prior to injection. Package may also be employed for prefilled cartridge of single ingredient.

3,563,374

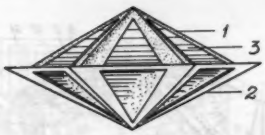
COMBINED PACKAGE FOR, AND CONTAINING TETRAHEDRAL CONTAINERS

Inge Lennart Carlsson, Lund, and Lars-Goran Andersson, Malmo, Sweden, assignors to AB Tetra Pak, Lund, Sweden, a corporation of Sweden

Filed Dec. 26, 1968, Ser. No. 787,152

Int. Cl. B65d *71/00, 5/00*

U.S. Cl. 206—65 **5 Claims**



Combined package for tetrahedral containers and the blank therefor which is the shape of a pyramid and has flaps integral therewith which secure the tetrahedron containers therein after packaging.

3,563,375

METHOD OF SELECTIVELY SEPARATING SOLID PARTICLES BY ELECTROSTATIC SORTING IN FLUIDIZED BED

Dominique Robert, Vincennes, Val-de-Marne, France, assignor to Societe de Produits, Chimiques D'Auby, Neully-sur-Seine, France

No Drawing. Filed July 26, 1968, Ser. No. 747,818

Claims priority, application France, Aug. 8, 1967, 117,154

Int. Cl. B03b *1/00*; **B03c** *7/02*

U.S. Cl. 209—9 **10 Claims**

Separation of particles is obtained by applying a cationic surface-active coating to the particles fluidizing the coated particles, and subjecting the fluidized coated particles to the action of an electrostatic-field-type separation.

3,563,376

PROCESS AND APPARATUS FOR SORTING ELONGATED ARTICLES SUCH AS BOBBIN TUBES OF TEXTILE MACHINES

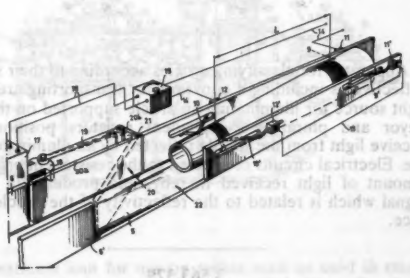
Giorgio Zegna and Giulio Zegna, Vallemosso, Vercelli, Italy

Filed Aug. 7, 1968, Ser. No. 750,983

Claims priority, application Italy, Sept. 27, 1967, 53149.A/67

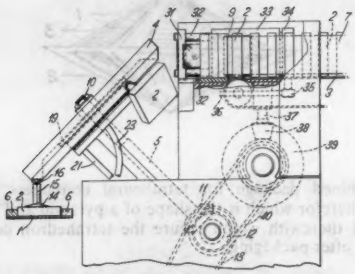
Int. Cl. B07c *5/344*

U.S. Cl. 209—73 **1 Claim**



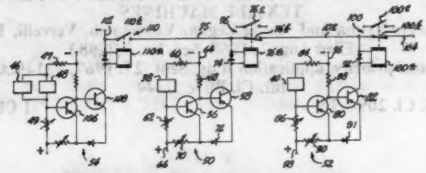
Elongated articles such as bobbin tubes are sorted automatically by providing each tube with two bands having different spacings for different article characteristics, e.g. color. The band spacings of the articles are detected automatically, e.g. electrically where the bands are conductive, by conveying the articles successively past different sorting stations, each responsive to a particular band spacing, at which removal of detected articles is effected automatically.

3,563,377
ARTICLE HANDLING APPARATUS
Frederick Southcott, London, England, assignor to Molins Machine Company Limited, London, England, a corporation of Great Britain
Filed Jan. 26, 1968, Ser. No. 700,757
Claims priority, application Great Britain, Feb. 2, 1967, 5152/67
Int. Cl. B65g 47/24
U.S. Cl. 209—74 14 Claims



A suction transfer device for cigarette packets comprises a rotary transfer disc having suckers which engage broad faces of successive packets lying flat on one conveyor and carry the packets to another conveyor at a higher level, delivering them in an upright position. The transfer disc is mounted on a shaft disposed at 45° to the broad faces of the packets on both conveyors.

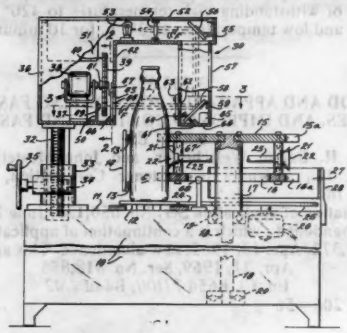
3,563,378
REFLECTION CLASSIFIER
Clifford E. Myers, Medford, Oreg., assignor to Welsh Panel Company, Longview, Wash., a corporation of Washington
Filed Feb. 29, 1968, Ser. No. 709,469
Int. Cl. B07c 5/342
U.S. Cl. 209—111.7 10 Claims



Apparatus for classifying articles according to their surface reflectivities including a conveyor for transporting articles, a light source for illuminating an article supported on the conveyor and plural light-dependent resistors positioned to receive light from the source reflected by an illuminated article. Electrical circuits connected to the resistors interpret the amount of light received thereby, and produce an output signal which is related to the reflectivity of the article's surface.

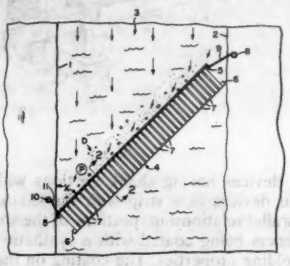
3,563,379
CONTAINER FILL LEVEL INSPECTION APPARATUS
Virgil Melvin Stapf, St. Louis, and James R. Gender, Kirkwood, Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo., a corporation of Missouri
Filed Nov. 12, 1968, Ser. No. 774,689
Int. Cl. B07c 5/342
U.S. Cl. 209—111.7 4 Claims

Apparatus for inspecting a moving series of containers to detect improperly filled and empty containers and reacting to reject the same from those properly filled, and including an inspecting head assembly containing the components which perform the inspecting as rapidly as containers are moved



through an inspection station without necessitating stop and start sequencing.

3,563,380
METHOD OF REMOVING FLOATING CONTAMINANTS FROM STREAMS
Frank B. Thomas, 713 Evergreen Drive, Akron, Ohio 44303
Filed Dec. 4, 1969, Ser. No. 882,168
Int. Cl. B01d 21/00
U.S. Cl. 210—83 2 Claims

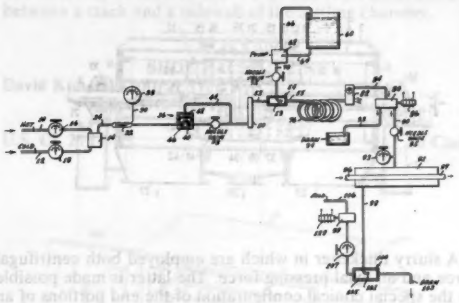


A method of removing oil, grease and other floating contaminants from a stream and it includes floating a barricade, which extends above the surface of the water, in a stream, and positioning this barricade at an acute angle to the direction of flow of the stream. The contaminants collect on the upstream face of the barricade and periodically are removed from the surface of the stream, and adjustable barricade means are present in the apparatus.

3,563,381
DIALYSIS APPARATUS
Andrew Charles Edelson, 10832 Charnock Road, Los Angeles, Calif. 90034, and Clyde Charles Nassau, 20602 Pacific Coast Hwy., Malibu, Calif. 90265
Filed Dec. 18, 1968, Ser. No. 784,830
Int. Cl. B01d 13/00
U.S. Cl. 210—96 7 Claims

The invention is a dialysis apparatus for supplying dialysate at controlled concentration to an artificial kidney. The system provides for a supply of water at controlled temperature, and a supply of dialysate concentrate with means for mixing the controlled temperature water and concentrate to maintain a supply of dialysate at a controlled degree of concentration to be supplied to the artificial kidney. The system does not have a tank or reservoir of dialysate at a maintained degree of concentration. Interlocking safety controls are provided so as to discontinue the flow of dialysate in the event

the temperature, the degree of concentration, or arterial pressure of the patient depart from predetermined limits. Additionally, audible and visual alarm signals are provided to indicate at all times when the said conditions are within limits and to indicate when any condition goes outside of the limits,



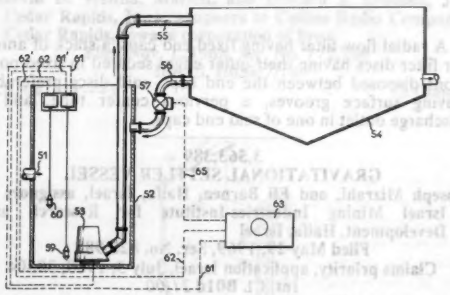
the indication being both audible and visual. Further, the system provides means to mute the audible signal while still maintaining the machine in operation and further means are provided to safely sterilize the machine without danger to the patient.

3,563,382

SEWAGE TREATMENT PLANTS

Jean Joseph Regent, Nantes, France, Compagne D'Etudes Et De Recherche Des Services Operationnels D'Assainissement in France-Campagnie SDAF, Issy Les Maulineaux (Seine) France

Filed Dec. 11, 1968, Ser. No. 782,817
Claims priority, application France, Dec. 12, 1967, 131,846
Int. Cl. B01d *21/10*
U.S. Cl. 210—104 **1 Claim**



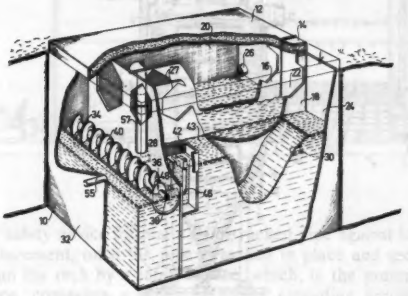
An automatically regulated plant for the treatment of sewage comprises a primary feeding tank for receiving liquid raw sewage, a pump immersed in said primary tank to feed the plant with the liquid discharged in the tank, means for controlling the operation of the pump, at least one digester with biologically active filter bed, means to convey a certain amount of the outflow of the treated effluent from said digester to the primary feeding tank, a valve for controlling the flow of the recirculated effluent, a program timer correlated with the means to control the operation of the pump and adapted to actuate the recirculation valve and to cause said valve to be drived into its open position after expiration of a delay period following the stopping of the pump.

3,563,383

PURIFICATION SYSTEM FOR ORGANICALLY CONTAMINATED WATER

Ake Hellquist, Svedudden, Djurhamn, and Sigvard Nordgard, 41 Becksjudarvagen, Nacka, Sweden

Filed Apr. 3, 1969, Ser. No. 813,195
Claims priority, application Sweden, Oct. 23, 1968, Apr. 24, 1968, 14339/68;5495/68
Int. Cl. B01d *21/24*
U.S. Cl. 210—124 **5 Claims**



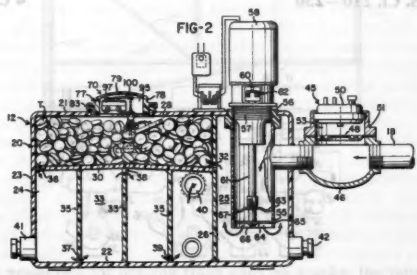
A purification system for organically contaminated water. The system comprises supporting areas that are active with respect to microorganisms and that are alternately immersed and withdrawn from the contaminated water while simultaneously being conveyed from an inlet to an outlet in a chamber containing said water.

3,563,384

AUTOMATIC MACERATOR UNIT

Ronald E. DeLaney, Dayton, Ohio, William H. Smyers, Jr., Wethersfield, Conn., Robert C. Helke, Dayton, Ohio, Ronald D. Russo, Wethersfield, Conn., and Gordon R. Carlson, Dayton, Ohio, assignors to Koehler-Dayton, Inc., Dayton, Ohio, a corporation of Ohio

Filed Oct. 3, 1968, Ser. No. 764,769
Int. Cl. C02c *1/00*
U.S. Cl. 210—152 **11 Claims**

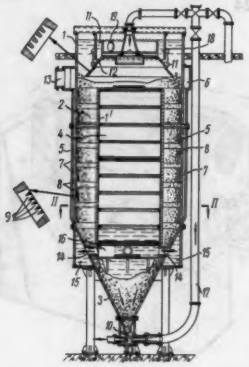


A treatment unit for use on toilets such as used in small ships including a housing having separate holding chambers with a treatment chamber disposed therebetween. A macerator reduces the size of solids in the first chamber from where the effluent flows into the treatment chamber containing a plurality of chemical tablets for purifying the effluent. The effluent then passes into the second holding chamber from which it is discharged from the unit. Sensing apparatus is provided to inactivate the macerator when the level of tablets is below a preset minimum, and a pressure operated time delay switch is utilized to initiate operation of the macerator upon an increase in pressure in the inlet to the unit.

3,563,385
SAND FILTER FOR WATER PURIFICATION

Sergei Ivanovich Bykov, Smolenskaya ul., 10, kv. 156, Moscow, U.S.S.R.

Filed Apr. 23, 1969, Ser. No. 818,596
Int. Cl. B01d *33/16*
U.S. Cl. 210—268 6 Claims

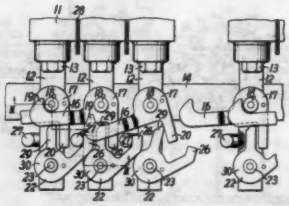


A sand filter for water purification comprises external channels for feeding water to be purified to the outer of two spaced, vertical walls which are water permeable along their entire height. The sand charge is between the walls. A water collecting chamber is provided within the inner wall and it communicates with a water collecting manifold arranged in the lower part of the filter. Self-cleaning grates are installed in the path of water flow from the openings in the outer wall to the sand charge between the walls.

3,563,386
APPARATUS FOR RELEASING AND COUPLING FILTER PLATES IN A FILTER PRESS

Ken-Ichiro Kurita, Suita, Japan, assignor to Kurita Machinery Manufacturing Company Limited, Osaka, Japan

Continuation-in-part of application Ser. No. 780,723, Dec. 3, 1968. This application Mar. 6, 1970, Ser. No. 17,152
Int. Cl. B01d *25/12*
U.S. Cl. 210—230 4 Claims

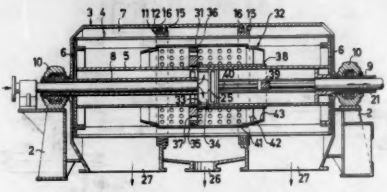


Each of the filter plates is provided with stud members disposed horizontally or vertically on opposite sides. Hook members are pivotally mounted on each filter plate so as to be associated with stud members on the next adjacent filter plate. A release arm formed on the actuating member and adapted to be engaged with a tail member of the hook member is associated with a release pin on the preceding filter plate so that when the preceding filter plate is separated from the following adjacent plate the actuating member on the following plate is forced to operate to release the hook member thereon from the stud member on the next filter plate.

3,563,387
CENTRIFUGAL THICKENER

Alf Torsten Okvist, Skarblacka, and Nils Olof Nilsmar, Kallhall, Sweden, assignors to Maskin AB N.A. Ele

Filed Oct. 31, 1968, Ser. No. 772,253
Claims priority, application Sweden, Nov. 2, 1967, 15,033/67
Int. Cl. B04b *3/02*
U.S. Cl. 210—376 5 Claims

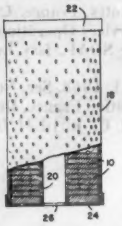


A slurry thickener in which are employed both centrifugal force and an axial pressing force. The latter is made possible by the special conical configuration of the end portions of an otherwise cylindrical thickening cylinder.

3,563,388
RADIAL FLOW DISK FILTER

Southwick W. Briggs, Chevy Chase, Md., assignor to William A. Brazerol, Washington, D.C., fractional part interest to each

Filed Feb. 3, 1969, Ser. No. 824,328
Int. Cl. B01j *25/18*
U.S. Cl. 210—457 5 Claims

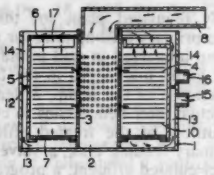


A radial flow filter having fixed end caps, a stack of annular filter discs having their outer edges secured in fixed positions disposed between the end caps, said discs preferably having surface grooves, a pervious center tube, and a discharge outlet in one of said end caps.

3,563,389
GRAVITATIONAL SETTLER VESSEL

Joseph Mizrahi, and Eli Barnea, Haifa, Israel, assignors to Israel Mining Industries-Institute for Research and Development, Haifa, Israel

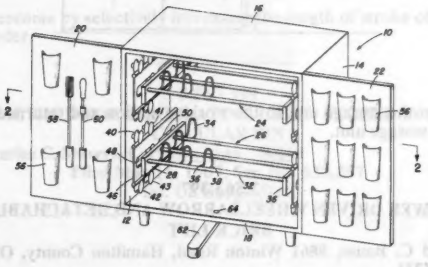
Filed May 29, 1969, Ser. No. 828,988
Claims priority, application Israel, July 3, 1968, 30304
Int. Cl. B01d *21/00*
U.S. Cl. 210—521 8 Claims



A gravitational settler vessel for use in combination with a mixer. The settler vessel is adapted for the separation of a

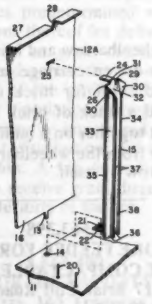
liquid-liquid dispersion in which the dispersed phase amounts to 10 to 70 percent by volume of the total dispersion. It comprises a settling chamber, at least two stacks of sloping, vertically spaced plates, and at the two sides of each such stack there are vertical channels, one of which serves for conducting the ascending lighter phase to a light phase-collecting chamber and the other for conducting the descending heavier phase to the heavy phase-collecting chamber. The vertical channels may be formed either between two vicinal stacks or between a stack and a sidewall of the settling chamber.

3,563,390
SHOE RACK CABINET
David Kim, 82 Central Ave., Rye, N.Y.
Filed Oct. 20, 1969, Ser. No. 867,665
Int. Cl. A47f *7/08*
U.S. Cl. 211—35 **10 Claims**



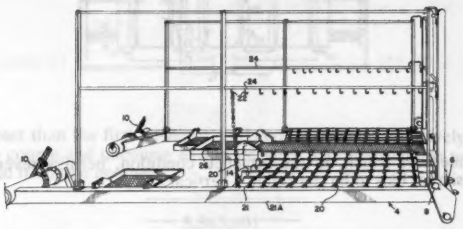
A shoe rack cabinet for holding shoes in a generally vertical disposition consists of a cabinet within which are slidably mounted a plurality of shoe rack means. The latter means are adapted to be slid in and out of the cabinet to provide temporary storage and to facilitate ready access to the shoes on the shoe rack means. Suitable shoe holder elements are mounted on the shoe rack means to support shoes in a generally vertically disposed position. The shoe rack cabinet of the present invention is particularly adaptable for use at the entrances to homes to facilitate removal of shoes upon entering the home.

3,563,391
CARD GUIDE
Marvin D. Weltha, Marion, and Howard J. Bronson, Jr., Cedar Rapids, Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa, a corporation of Iowa
Filed Nov. 1, 1968, Ser. No. 772,784
Int. Cl. H05k *7/14*
U.S. Cl. 211—41 **3 Claims**



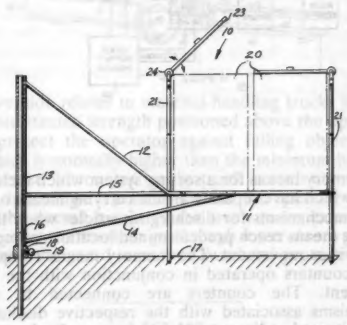
A circuit board guide mount affixed to parallel spaced sideplates with mechanical indexed mounting for both ends of each guide mount and with adhesive used between each guide mount and its sideplate for obtaining the mounting strength required through an extended service life with repeated insertion and withdrawals of circuit cards or boards.

3,563,392
PIPE RACKING PLATFORMS FOR DRILLING RIG MASTS AND THE LIKE
John Hart Wilson, P.O. Box 1031, c/o Wilson Manufacturing Co., Wichita Falls, Tex. 76307
Filed May 28, 1969, Ser. No. 836,684
Int. Cl. A47f *7/00*
U.S. Cl. 211—60 **7 Claims**



A safety device for maintaining racked pipe against lateral displacement, once the pipe is racked in place and secured within the rack by a safety device, which, in the present instance, comprises a series of chains extending across the racking beams, with means on the racking beams, such as recesses to receive the chains. Provision is made to hang up each of the chains once a row of racked pipe is removed from between the beams which receive the pipe.

3,563,393
TRASH-LOADING DEVICE
Perry H. Kothe, Glenrock, Wyo., assignor to Leland Oklie Crouch, Glenrock, Wyo., part interest
Filed Sept. 16, 1968, Ser. No. 759,953
Int. Cl. B65f *1/14*
U.S. Cl. 211—71 **1 Claim**

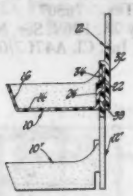


An apparatus for loading trash cans on trucks, the device comprising a pivotable sleeve supported on a post, an extended platform integral with the sleeve and upon which trash cans are placed so as to be pivotally swung in front of or behind a truck.

3,563,394
BIN ASSEMBLY HAVING DETACHABLE SUPPORT MEMBER
James E. Joyce, 878 Darien Circle, Rochester, Mich. 48063
Filed Feb. 11, 1969, Ser. No. 798,372
Int. Cl. A47f *3/14*; **B65d** *21/00*
U.S. Cl. 211—126 **12 Claims**

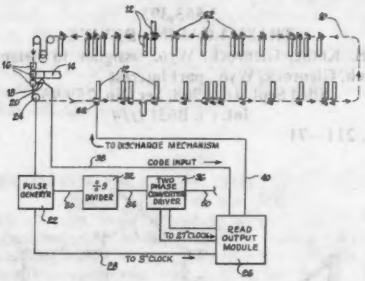
A storage bin of the type used to hold relatively small arti-

cles in batch quantities and having a detachable back support



member which, in the attached condition, permits several similar bins to be stacked in a vertical array.

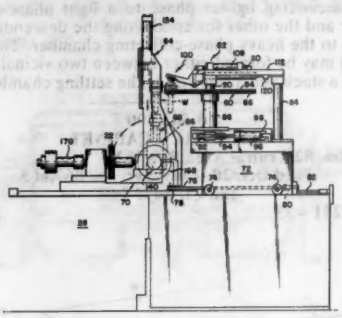
3,563,395
ELECTRONIC COUNTER MEMORY MEANS FOR SORTING SYSTEMS
Leo A. Gary, Chicago, Ill., assignor to The Spra-Con Company, Chicago, Ill.
Filed Jan. 19, 1970, Ser. No. 003,930
Int. Cl. B65g *43/00*
U.S. Cl. 214—11 **10 Claims**



A memory means for a sorting system which includes conveyors which have separate article carrying means of the type having mechanisms for discharging articles when the article carrying means reach predetermined locations along the path of conveyor movement. The memory means comprise electronic counters operated in conjunction with the conveyor movement. The counters are connected to discharge mechanisms associated with the respective discharge locations situated adjacent the conveyor. Each counter is designed to operate the discharge mechanisms when a code unique to that counter is applied at a coding station and after the conveyor has moved a specified distance. Each counter has a plurality of terminals which may be alternatively selected to thereby vary the discharge position by distance increments.

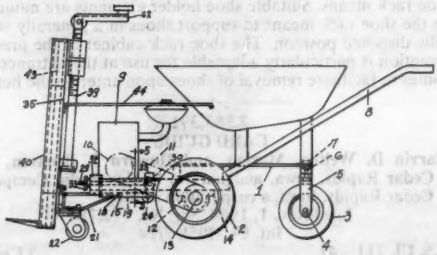
3,563,396
WORKPIECE FEEDING MECHANISM
John Leonard, Waynesboro, Pa., assignor to Landis Machine Company, Waynesboro, Pa., a corporation of Pennsylvania
Filed Sept. 30, 1968, Ser. No. 763,653
Int. Cl. B65g *47/06*
U.S. Cl. 214—1 **1 Claim**

Apparatus for feeding workpieces to and removing workpieces from a work forming station, which is typically located between a pair of opposed rolls which rotate about parallel axes. The workpieces are manually or automatically properly oriented and placed in a storage unit and are transferred



from the storage unit to the working station and returned to the storage unit.

3,563,397
POWER DRIVEN WHEELBARROW AND DETACHABLE BRICK LIFT
Fred C. Bause, 8861 Winton Road, Hamilton County, Ohio 45231
Filed May 12, 1969, Ser. No. 823,542
Int. Cl. B66b *9/20*
U.S. Cl. 214—1 **3 Claims**

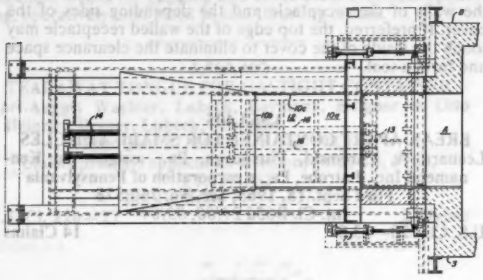


A power-driven wheelbarrow and brick transporting device comprising a motor-driven carriage supporting a wheelbarrow for mortar and a lift for brick and/or building block whereby mortar and a stack of brick and/or building block can be moved about together on a building site, and the brick lift can be detached from the wheelbarrow when it is desired to use the wheelbarrow by itself.

3,563,398
VARIABLE STROKE FEEDER FOR MOVING REFUSE AND LIKE COMPACTABLE MATERIAL
Bertram B. Reilly, 17 Briar Cliff Road, Pittsburgh, Pa., and Milton F. Guy, 8148 Halcyon Court, Grosse Ile, Mich.
Filed Apr. 11, 1969, Ser. No. 815,423
Int. Cl. F23k *3/00*
U.S. Cl. 214—23 **7 Claims**

The disclosure is directed to a variable stroke mechanical feeder for compacting and moving of municipal mixed refuse over the insulated hearth of a combustion furnace. As the degree of compaction of such mixed refuse increases, the re-

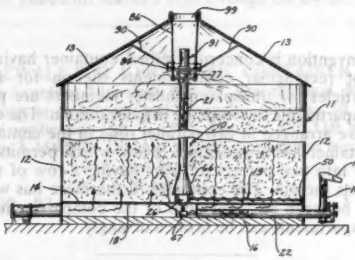
sistance of the refuse to moving over the insulated hearth of the furnace also increases. This increased resistance has been



overcome by selectively increasing the length of stroke of the feeder.

3,563,399
METHOD FOR CIRCULATING GRAIN STORED IN A CIRCULAR BIN

Charles C. Shivers, Corydon, Iowa 50060
Filed May 15, 1967, Ser. No. 638,257
Int. Cl. B65g *65/46*
U.S. Cl. 214—152 **3 Claims**

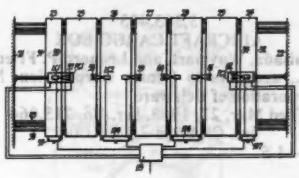


A sweep auger radially mounted within a storage bin is rotatable horizontally across the bin floor about a vertical axis located centrally of the bin. An upright distributing auger arranged coaxially with the vertical axis has its lower end adjacent the inner end of the sweep auger and its upper end spaced from the roof of the bin. The sweep auger is of a construction such that for each complete revolution across the bin floor it moves predetermined volumes of material over given axial sections thereof for delivery to the distributing auger. The material or grain discharged from the distributing auger is spread across the top surface of the grain stored in the bin. All of the grain in the bin is thus acted upon continuously for circulation through the bin for drying purposes. Field grain may be introduced through the roof of the bin for concurrent distribution and circulation with the grain already in the bin. A bin unloading auger is located below the bin floor to receive grain directly from the sweep auger for discharge exteriorly of the bin.

3,563,400
STORAGE FACILITY

Richard Johnson Greaves, 165 Tramway Parade, Beaumaris, Victoria, Australia
Filed Nov. 8, 1968, Ser. No. 774,429
Claims priority, application Australia, Nov. 10, 1967
Int. Cl. E04h *6/34*
U.S. Cl. 214—16.1 **12 Claims**

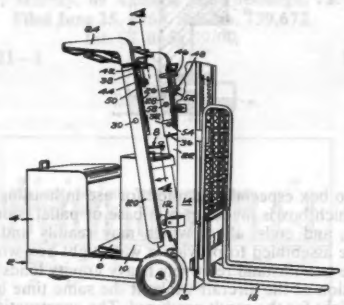
A mobile storage facility comprising three or more storage structures arranged successively along a track and each movable along the track, drive means operable to move the two end structures in mutually opposite directions between first positions in which all of the structures are closed onto one another and second positions which are spaced further



apart than the first positions, and coupling means selectively to couple and uncouple each successive pair of structures to and from one another.

3,563,401
HINGED OVERHEAD GUARD FOR TRUCK

Peter F. Gandolfo, Wellesley, Mass., assignor to Hyster Company, Portland, Oreg.
Filed July 29, 1968, Ser. No. 748,284
Int. Cl. B66f *9/20*
U.S. Cl. 214—672 **3 Claims**



The invention relates to material-handling trucks having a guard of substantial strength positioned above the operator's area to protect the operator against falling objects. The guard, which is normally higher than the minimum height of the truck mast, is mounted on the truck in such manner that it may be lowered to a position behind the operator thereby reducing the overall height of the truck to an extent sufficient to permit the truck to go through lower doorways than possible with the guard in normal overhead protective position.

3,563,402
PLASTIC GASKET RINGS AND GASKET LININGS

Heinrich Arnold, Maetzelweg 7, Hamburg-Volksdorf, Germany
No Drawing. Continuation-in-part of application Ser. No. 507,651, Nov. 15, 1965, now abandoned. This application Feb. 9, 1968, Ser. No. 704,235
Int. Cl. B65d *53/06*
U.S. Cl. 215—40 **11 Claims**

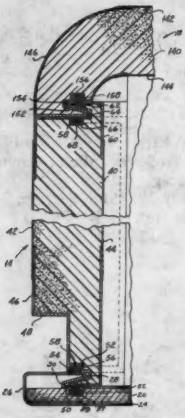
Improved gasket linings or rings prepared from novel plastic compositions which are resistant to thermal and mechanical stresses encountered in use, and, when incorporated in a closure, as, for instance, for a glass container, provide a hermetic seal therefor. The plastic compositions comprise a mixture of 50 parts by weight of a polyvinylchloride or a copolymer of vinylchloride with either vinylidene chloride or vinyl acetate, 10—100 parts by weight of a plasticizer into which there has been incorporated 5—200 parts by weight of synthetic rubber. The mixture, after having been worked to form a homogeneous paste, is flowed onto

the inner surface of a metal cap, hood, or like closure and thereafter heat treated whereby the plastic is converted into a gel. Following cooling, the gel is converted into a viscous and coherent film and constitutes the gasket ring or lining.

3,563,403
AIRCRAFT CARGO BOX

August G. Luisada, Waymart, and Leonard P. Frieder, Clarks Green, Pa., assignors to Gentex Corporation, New York, N.Y., a corporation of Delaware

Filed Mar. 21, 1968, Ser. No. 715,064
Int. Cl. B65d *7/24, 53/00*
U.S. Cl. 220—1.5 **16 Claims**

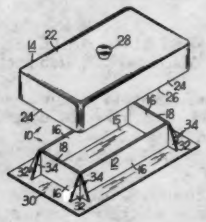


A cargo box especially adapted for use in housing aircraft cargo, which box is made up of a base or pallet, sides, a top or cover, and ends, all of which may readily and expeditiously be assembled to provide a watertight box which is at once able to withstand relatively heavy gravity loads incident to operation of the aircraft while at the same time being extremely light for the result produced. The construction of the box is such that it may readily be knocked down upon arrival at a destination and reused.

3,563,404
SANITARY INSULATED CONTAINER FOR SEMISOLID SUBSTANCES

Ward E. Barchus, 2803 W. Burnham St., Milwaukee, Wis.

Filed Oct. 15, 1968, Ser. No. 767,706
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 **3 Claims**

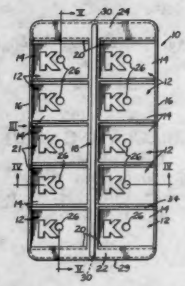


A sanitary insulated container for a semisolid substance such as butter or the like comprises a walled receptacle, a cover with depending sides, cover supporting means associated with the receptacle, and cover directing means associated with the receptacle. As the cover is put in place, it is directed to a predetermined position on the cover supporting means in such a manner that the cover edges and inner surfaces of the depending sides do not touch the top edge of the walled receptacle. When in place, a small clearance space exists between the top edge of the walled receptacle and the inside of the cover and thermal insulating space exists between the walls of the receptacle and the depending sides of the cover. If preferred, the top edge of the walled receptacle may touch the inside of the cover to eliminate the clearance space and form a seal.

3,563,405
BREAK APART CONTAINER FOR SMALL ARTICLES

Leonard A. Zaremski, Pittsburgh, Pa., assignor to Kennametal Inc., Latrobe, Pa., a corporation of Pennsylvania

Filed Sept. 18, 1968, Ser. No. 760,578
Int. Cl. B65d *21/00, 83/04*
U.S. Cl. 220—23.8 **14 Claims**

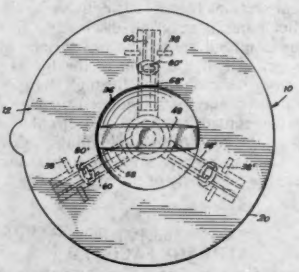


The invention is concerned with a container having a plurality of rectangular compartments therein for receiving small articles for transparent blister members are placed in the compartments to retain the articles therein. The compartments are arranged in two parallel rows in the container and the container has a weakened region which permits it to be stepped into two parts, each part having a row of the compartments therein. The container furthermore has weakened regions between adjacent ones of the compartments so that the compartments can be broken of singly.

3,563,406
CLOSURE UNIT

Richard Ferrante, Flushing, N.Y., assignor to BFG Marine Supply Co., Inc., New York, N.Y., a corporation of New York

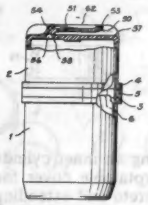
Filed June 10, 1969, Ser. No. 831,942
Int. Cl. B65d *45/00*
U.S. Cl. 220—25 **7 Claims**



The present invention relates to a closure unit adapted for use in an opening provided in a wall, in a sealing relation. The unit comprises a cover plate mounted on one side of said opening and an anchoring mechanism arranged at the other side for securing the cover plate against said opening. The anchoring mechanism comprises adjustment means rotatably

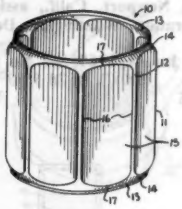
mounted on said cover plate, operable from both sides of said opening, thrusting means threadedly movable in an axial direction upon rotation thereof, and engageable and disengageable means for gripping said cover plate over said opening, operatively connected to said thrusting means.

3,563,407
TEARAWAY TONGUE FOR GASTIGHT CONTAINER
Karl-August Wachter, Lubeck, Germany, assignor to Otto Heinrich Drager, Lubeck, Germany
Filed Jan. 27, 1969, Ser. No. 794,143
Claims priority, application Germany, May 14, 1968, P1,759,552
Int. Cl. B65d *17/24, 17/20*
U.S. Cl. 220—27 **2 Claims**



The cover for a gastight container for a breathing apparatus has formed in one piece therewith a tearaway tongue which when pulled off leaves a hole through the cover.

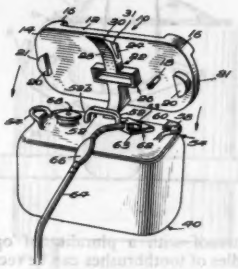
3,563,408
SIDEWALL FOR A PRISMATIC CONTAINER
Leonardus Arnoldus Nicholaas Bijvoet, Bloemendaal, Netherlands, assignor to Inland Steel Company, Chicago, Ill.
Original application Oct. 7, 1966, Ser. No. 585,110, now Patent No. 3,459,023. Divided and this application Nov. 22, 1968, Ser. No. 816,427
Int. Cl. B65d *7/02, 7/42*
U.S. Cl. 220—83 **1 Claim**



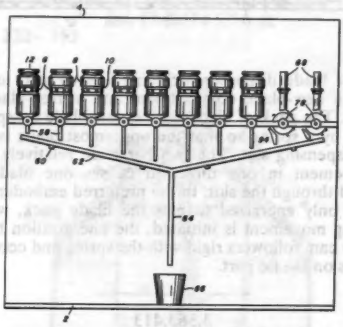
A sidewall for a prismatic shipping container is disclosed in which radially expandable die segments are used to engage a cylindrical blank of sheet material and thereby form straight axial side edges and convex connecting end edges to define flat prismatic side surfaces.

3,563,409
DEVICE TO ENABLE VERTICAL STACKING OF MARINE GASOLINE TANKS OR CONTAINERS
Everett W. Gray, 700 Hammond St., Bangor, Maine
Filed Apr. 21, 1969, Ser. No. 817,744
Int. Cl. B65d *21/02;* **B67d** *5/60*
U.S. Cl. 220—97 **7 Claims**

A device for supporting a plurality of containers or tanks in vertically stacked relationship relative to one another, the device comprising an elongated substantially rectangular quadrilateral plate having means projecting from one side thereof cooperating with means on the upper end wall of a conventional first or lowermost marine gasoline tank or container to prevent inadvertent or accidental longitudinal and lateral shifting of the plate and said first tank relative to one another; and means on said plate projecting laterally from an opposed side thereof to releasably receive therein means cooperating therewith on the lower end of a second conventional marine gasoline tank to prevent inadvertent or accidental longitudinal and/or lateral relative movement between said plate and said second marine gasoline container or tank.



3,563,410
MEDICATION-DISPENSING DEVICE AND METHOD
Jerome G. Murray, 69 Amanda St., Pittsburgh, Pa. 15210
Filed June 25, 1968, Ser. No. 739,672
Int. Cl. B65g *59/00*
U.S. Cl. 221—1 **1 Claim**

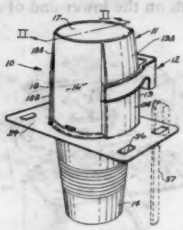


This invention relates to method and apparatus for dispensing medication in the form of pills or capsules for a number of patients in a ward or wing of a hospital or similar mass treatment institution. There is provided a machine that will release a desired number of pills or capsules of a given kind and dispense the pills into a medication cup. Adjustable selection apparatus is provided for determining and controlling the number of pills or capsules to be released from a given medication reservoir. Audible signals indicating the number of pills or capsules dispensed are simultaneously provided as a safety measure.

3,563,411
CUP DISPENSER
Michael W. Carroll, Bloomingdale Township, DuPage County, Ill. (250 Lincoln St., Roselle, Ill. 60172)
Filed Dec. 26, 1968, Ser. No. 786,938
Int. Cl. B65h *1/00*
U.S. Cl. 221—63 **8 Claims**

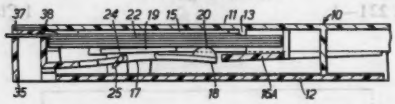
An inverted, cup-shaped cup dispenser having recesses in opposite sides of the wall thereof for receiving the spaced legs of a substantially U-shaped bracket for supporting the

cup-shaped dispenser upon wall means. The dispenser is made of plastic and has an integral flange near the open,



lower edge thereof with a plurality of openings through which the handles of toothbrushes can be received.

3,563,412
RAZOR BLADE DISPENSERS
Michael James, Welwyn Garden City, England, assignor to Wilkinson Sword Limited, London, England
Filed Nov. 6, 1968, Ser. No. 773,748
Claims priority, application Great Britain, Nov. 8, 1967, Jan. 31, 1968, 50,685/67;4,862/68
Int. Cl. B65h *5/00*
U.S. Cl. 221—224 **10 Claims**



A razor blade dispenser including a body part and a lid part has a new-blade compartment and a used-blade compartment. The pack of blades in the new-blade compartment is biased by a spring so that the uppermost blade is aligned with a dispensing slot. The two parts are relatively slidable and movement in one direction causes one blade to be dispensed through the slot. In the preferred embodiment, the spring is only energized to bias the blade pack, when the dispensing movement is initiated, the energization being effected by cam followers rigid with the spring and cooperating with rams on the lid part.

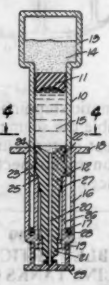
3,563,413
CONTAINER DISPENSING DEVICE
William Gordon, Silver Spring, Md., assignor to Alex Logar, Bethesda, Md., a part interest and B. P. Fishburne, Jr., Washington, D.C., a part interest
Filed June 25, 1969, Ser. No. 836,237
Int. Cl. B67b *7/28*
U.S. Cl. 222—83.5 **9 Claims**

A measuring device for detachable connection to a bottle or other container for fluent materials which is fitted with a resilient cover at its outlet and a flexible slotted diaphragm adjacent to its inlet, with an actuating rod extending therebetween, so that upon momentary flexing of the cover inwardly when the container is inverted, the actuating rod opens the slots in the diaphragm to permit a desired amount of the fluent material to pass to the measuring device, and which upon release of the resilient cover, permits the slots to reclose and to seal off communication between the measuring device and the container, following which the measured contents of the measuring device may be poured therefrom by opening the cover.

3,563,414
DISPENSING CONTAINER
Maurice Coulombe, 4296 Place Charles Bedard, Charlesbourg, and Yvon Bureau, 1335 St. Henri St., Quebec, Canada
Filed July 12, 1968, Ser. No. 744,425
Int. Cl. B65d *25/38*
U.S. Cl. 222—130 **6 Claims**

A container having an inner cylindrical wall, a stationary radial partition, a rotatable cover for the container and a spatula, secured thereto and extending within the container, whereby rotation of the cover will discharge the contents of the container through an orifice in the cover. In accordance with one embodiment, the container is used for toothpaste and the cover has an upstanding hook-shaped member facing the cover orifice for receiving the head of a toothbrush which is used for rotating the cover with the bristles directed towards the orifice directly receiving the toothpaste issuing from the orifice. The container has preferably a central compartment for storing the tooth brush. In accordance with another embodiment, the container is formed with two coaxial compartments and two separate spatulas depend from the cover and are in respective slidable contact with the walls of the respective compartment to simultaneously discharge two different products in proportionate amounts, such as a polymerizable material and a catalyst therefor.

3,563,415
MULTIDROP ADAPTER
Robert W. Ogle, Newport, Calif., assignor to Multi-Drop Adapter Corporation, Wilmington, Del., a corporation of Delaware
Filed June 4, 1969, Ser. No. 830,308
Int. Cl. B67d *5/60*
U.S. Cl. 222—145 **10 Claims**



A multidrop adapter or dispenser in which a tubular member which may have an enlarged head for containing a powder or substance to be mixed with a liquid in the remainder of the tubular member is telescopically received in a second tubular member which seals one end of a piston which extends into the first tubular member and has a bore which extends out of said second tubular member to expel a drop of liquid when said first tubular member is telescopi-

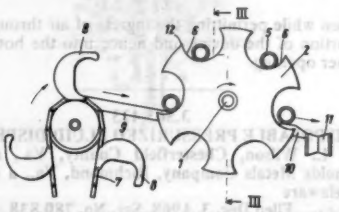
cally moved into said second tubular member and over said piston; and resilient means biasing said first tubular member out of said second tubular member. A plug in said first tubular member is dispelled into said enlarged head upon movement of said first tubular member over said piston when said enlarged head is employed in the invention.

3,563,416

DEVICE FOR EMPTYING LIQUID CONTAINING PIPES

Paul Dobrink, Lintorf, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 12, 1969, Ser. No. 806,350
Claims priority, application Germany, Mar. 21, 1968, P 17 58 018.6
Int. Cl. B67d *3/00*
U.S. Cl. 222—166 **8 Claims**



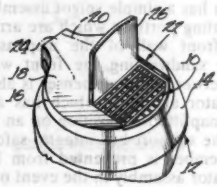
The device comprises rotating shaft fixedly supporting a number of carrying discs. The discs have at their periphery radially arranged U-shaped recesses for receiving and lifting the pipes. The depth of recesses on consecutive discs is progressively varied so as to incline the pipe at an acute angle during the rotation of the discs.

3,563,417

DISPENSING GRID

Robert H. Jordan, Chicago, and Robert F. Boldt, Des Plaines, Ill., assignors to Morton International, Inc., Chicago, Ill., a corporation of Delaware

Filed Nov. 25, 1968, Ser. No. 778,463
Int. Cl. A47g *19/24*
U.S. Cl. 222—189 **6 Claims**



A dispensing grid for use in a dispenser for solid, particulate matter, such as salt, features rounded upper surfaces and wedge-shaped lower surfaces, the intersecting ribs comprising the grid preferably being at two levels. The grid is preferably disposed on an interior surface of the dispenser, across an opening through which dispensed material may pass, and beneath a flush-fitting closure. The rounded upper surfaces minimize salt entrapment beneath the flush-fitting closure, and the chisel-point lower surfaces break up agglomerated lumps of the material.

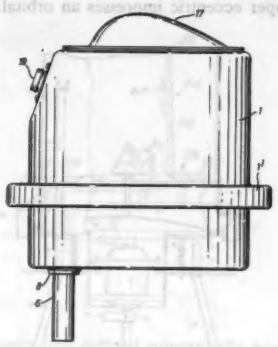
3,563,418

DETERGENT FOAM GENERATOR

Douglas Albert Hahn, Chinnor, England, assignor to Reckitt & Colman Products Limited, Dansom Lane, Hull, England, a British company. By mesne assignments

Filed Apr. 4, 1969, Ser. No. 813,662
Int. Cl. A47l *13/00*; **B67d** *5/58*
U.S. Cl. 222—190 **4 Claims**

A detergent foam generator attachable to a floor cleaning appliance having at least one rotary brush and comprising a liquid reservoir casing, which may be made of plastics material, formed with a tubular portion in which is an electric motor driving a fan and having a cap forming an airflow



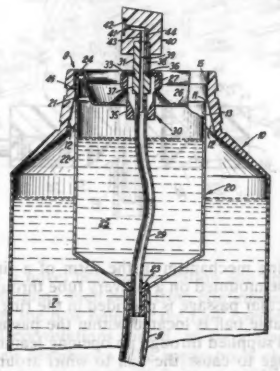
path containing a nonreturn valve to a pipe extending into the interior of the casing, and a foam outlet pipe leading from the top of the casing out to therebelow.

3,563,419

DISPENSING DEVICE CONTAINER

Robert A. Coerver, Jr., New York, N.Y., and Paul A. Marchant, Kansas City, Mo., assignors to Precision Valve Corporation, Yonkers, N.Y. and Imco Container Company, Kansas City, Mo.

Filed Jan. 11, 1967, Ser. No. 608,655
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 **3 Claims**



A pressurized dispenser having separate product and propellant containers comprising an inner container for the propellant fitted into the mouth opening of an outer product container. Passages are formed in the region of the mouth to vent from the product container air displaced by the placement of the propellant container within the product container. These vent passages are closed when the containers are completely assembled.

3,563,420

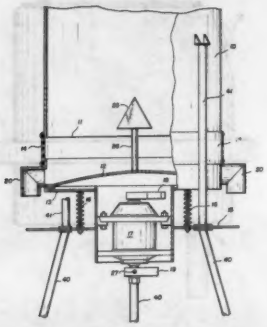
VIBRATORY EVACUATOR

Charles H. Ansley, 35 Farview Hill, Rochester, N.Y. 14620

Filed June 17, 1969, Ser. No. 834,084
Int. Cl. B65g *3/12*
U.S. Cl. 222—199 **12 Claims**

A vibratory evacuator has a base with coil springs on which a vibratory element is mounted so that its upper sur-

face is arranged below an outlet for material to be evacuated. The vibratory element includes a motor mounted beneath the upper surface and having a vertical shaft turning an upper eccentric above the motor and a lower eccentric below the motor. The upper eccentric impresses an orbital and generally

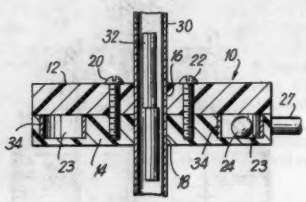


horizontal vibration on the element, and the lower eccentric impresses successive tilting motions on the element. At least one discharge passageway leads from the upper surface radially outward from the region of the motor for evacuating the material that is fluidized by the vibration motion.

3,563,421
VIBRATING MECHANISM

Harold F. Coates, Hatboro, and Samuel J. Greger, Glenside, Pa., assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Aug. 9, 1968, Ser. No. 751,502
Int. Cl. B65g *65/70*
U.S. Cl. 222—196 **5 Claims**



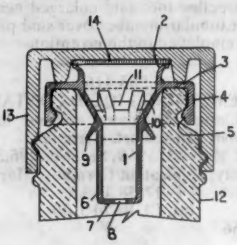
A vibrating mechanism in the form of a ring housing arranged to be mounted on a delivery tube through which parts pass. A circular passage is provided in the ring housing and a freely movable ball is located within the passage. Air, under pressure, is supplied through an opening leading into the circular passage to cause the ball to whirl around the passage and hit against the walls of the passage. An exhaust opening is provided to permit the air to leave the passage.

3,563,422
POURING DEVICE FOR A BOTTLE

Charles B. Cruikshank, Glasgow, Scotland, assignor to Daniel Montgomery & Son, Limited, Glascow, Scotland, a corporation of the United Kingdom of Great Britain and Northern Ireland, a part interest

Filed Mar. 21, 1968, Ser. No. 715,009
Claims priority, application Great Britain, Mar. 22, 1967, 13,332/67
Int. Cl. B65d *23/04, 25/48*
U.S. Cl. 222—478 **1 Claim**

A pouring device for facilitating smooth liquid flow from a bottle by establishing a path for liquid flow from the bottle and a further path for the ingress of replacement air into the bottle. The device has a central tubular portion with an aperture at the inner end and an outwardly flared conical portion at the bottle opening. A flange at the bottle opening attaches the device to the bottle itself. Ports in the outwardly flared conical portion permit outward flow of liquid in an axial

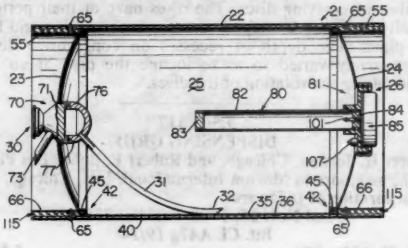


direction while permitting the ingress of air through the central portion of the device and hence into the bottle through the inner opening.

3,563,423
DISPOSABLE PRESSURIZED FLUID DISPENSER

Calvin L. Wilson, Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va., a corporation of Delaware

Filed Dec. 3, 1968, Ser. No. 780,838
Int. Cl. B65d *83/00*
U.S. Cl. 222—396 **12 Claims**



A self-contained disposable automatic dispenser for fluid products which has a simple spigot assembly comprised of a pair of cooperating portions which are arranged on opposite sides of the front wall of the dispenser and snapfitted together while sandwiching the front wall in a fluidtight manner therebetween. The dispenser is also provided with a pressure regulator assembly which has a bellows member which is also snapfitted in position on an associated support therefor and the support has integral safety means assuring the bellows member is prevented from being blown away from the regulator assembly in the event of a faulty regulator assembly.

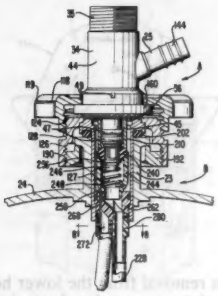
3,563,424
BEER TAP

Mack S. Johnston, Rolling Hills, Calif., assignor to Johnston Enterprises, Inc., East Kalispell, Mont.

Continuation of application Ser. No. 676,291, Oct. 18, 1967, which is a continuation-in-part of application Ser. No. 611,610, Jan. 25, 1967, now Patent No. 3,410,458, which is a continuation-in-part of application Ser. No. 587,627, Oct. 18, 1966, now Patent No. 3,422,448, which is a continuation of application Ser. No. 406,682, Oct. 27, 1964, now abandoned, which is a continuation-in-part of application Ser. No. 395,084, Jan. 25, 1966, now Patent No. 3,231,154, which is a continuation of application Ser. No. 150,982, Nov. 8, 1961, now abandoned, which is a continuation-in-part of application Ser. No. 25,592, Apr. 29, 1960, now abandoned, which is a continuation of application Ser. No. 159,818, Dec. 8, 1961, now Patent No. 3,156,252. This application Mar. 26, 1969, Ser. No. 814,883
Int. Cl. B65d *83/14*
U.S. Cl. 222—400.7 **23 Claims**

This invention relates to a beer-tapping device and especially to an improved adapter for attachment in the beer out-

let of a standard keg. It comprises a metallically enclosed, readily assembled unit, insertable from outside the keg with a laterally offset liquid passageway through the adapter. The offset passage takes optimum advantage of the limited space



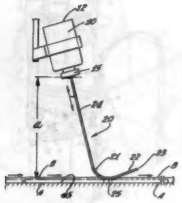
available while, at the same time, the unit is compatible with existing systems. Also disclosed is a novel metallic locking unit for separating the beer and gas passageways in the adapter as well as a novel flexible resilient check valve for the gas passage through the adapter.

3,563,425

LIQUID DISPENSER HAVING CAPILLARY OUTLET

Thomas C. Clark, Playa del Rey, Calif., assignor to Phil Mustain

Filed Jan. 6, 1969, Ser. No. 789,208
Int. Cl. B67d *3/00*
U.S. Cl. 222—478 **11 Claims**



A liquid-dispensing apparatus is disclosed in which an L-shaped capillary tube extends down from a container holding the liquid. The container has capillary relief openings and the tube has a narrow slot in the bent portion of the L, through which liquid is dispensed upon contact with a wettable surface.

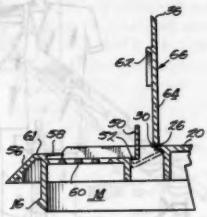
3,563,426

PLASTIC CONTAINER TOP WITH COMBINATION CLOSURE AND SPRINKLER

Benjamin M. Bartilson, Columbus, Ohio, assignor to Morton International, Inc., Chicago, Ill.

Filed July 3, 1969, Ser. No. 838,927
Int. Cl. B65d *47/00*
U.S. Cl. 222—556 **10 Claims**

This low-cost, one-piece integrally molded plastic container top for containers of particulate substances such as salt features a wall member having an opening with a hingedly-attached cover and a recessed perforated sprinkler plate across the opening. Access openings for mold parts adjacent the sprinkler plate are effectively sealed against undesired



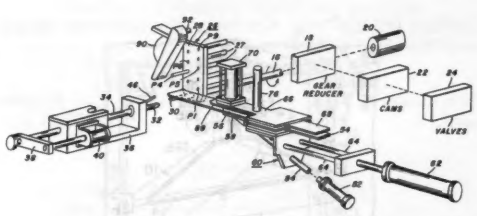
leakage by a snap flap molded substantially normal to said sprinkler plate and flexed athwart said opening.

3,563,427

BOW AND FORMING MACHINE THEREFOR

Henry R. Fichter, Pittsburgh, Pa., assignor to Papercraft Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Aug. 14, 1968, Ser. No. 752,535
Int. Cl. A41h *43/00*
U.S. Cl. 223—46 **10 Claims**



Described is a novel bow configuration and apparatus for automatically forming such bows from continuous lengths of ribbon material, the bow being of the type comprising a plurality of spiral convolutions joined, as by a staple, at one point about their peripheries. The apparatus is characterized in that the ribbon is automatically fed to a winding machine, the bow formed, and a piece of pressure-sensitive tape or card stapled to the bow at the peripheral point of contact of the various bows, all of this occurring during one continuous cycle of the machine.

3,563,428

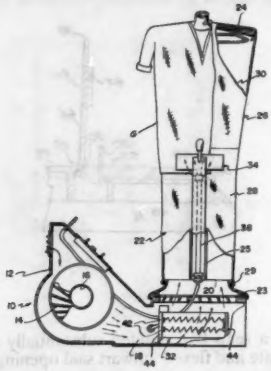
ELECTRIC AIR FINISHER

Peter D. Rasmussen, Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 2, 1970, Ser. No. 000,369
Int. Cl. A41h *5/00, 5/02*
U.S. Cl. 223—70 **10 Claims**

An electric air form garment finisher including a frame upon which the garment is dressed, a blower for forcing air under moderate pressure through the garment, separate electric heaters for heating the air before passing through the garment, and control means for actuating the heaters for a

standby low output situation where the separate heaters are connected in an in series circuit and further for actuating the

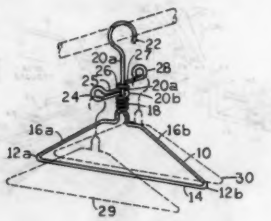


heaters for a high output finishing situation where the heaters are connected in an in-parallel circuit.

3,563,429
GARMENT HANGER

George R. Monks, 944 Foothill Drive, Colma, Calif. 94015

Filed Dec. 19, 1969, Ser. No. 886,478
Int. Cl. A47j *51/09*
U.S. Cl. 223—92 5 Claims



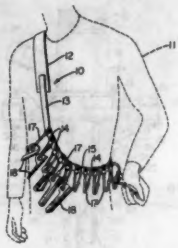
A wire hanger of simple construction for garments which comprises a pair of symmetrically ascending shoulder-supporting runs having their upper end portions bent upwardly and twisted one about the other to hold them together. Above the twisted area one of said end portions is bent in the customary manner into a hook for engagement over a peg or rod, while the other end portion is bent into a loop projecting laterally within a plane substantially at right angles to the plane defined by said shoulder runs, is returned to and wound a full turn about the said first mentioned end portion and is finally formed into a hook on the opposite side of the hanger substantially within the same plane within which said loop is located. Thus, additional hangers with garments supported therefrom may be suspended from the loop and the hook on the opposite sides of the original hanger.

3,563,430
CARRIER FOR ARTICLES SUCH AS PITONS

William E. Forrest, 2034 Franklin St., Denver, Colo. 80202

Filed July 22, 1968, Ser. No. 746,339
Int. Cl. A45f *5/00*
U.S. Cl. 224—5 10 Claims

A carrier for removably supporting a plurality of articles in a sorted arrangement and particularly pitons used for mountain climbing includes a body mount preferably of a bandoleer type having spaced support stations, and a piton retainer member is removably attached at selected of the bandolier support stations and firmly held thereto in a fixed, upright, ready to use position. Each retainer member is comprised of an elongated piece shaped in a closed loop of a particular configuration including a lower hook portion on which the pitons are carried in a depending manner, an upper inclined portion on which the pitons may be temporarily supported

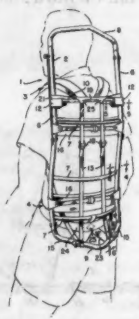


for selective piton removal from the lower hook portion and a pressure responsive gate portion formed in an outer side having an upper free end arranged to move outwardly to open the closed loop for selective piton removal and replacement and arranged to automatically return to the closed position.

3,563,431
SELF-ADJUSTING PACKFRAME

Murray J. Pletz, 5227 Pleasure Point Lane, Bellevue, Wash. 98004

Filed Nov. 6, 1968, Ser. No. 773,912
Int. Cl. A45f *3/08*
U.S. Cl. 224—25 5 Claims



A packframe for hikers is constructed using side and cross-members rigidly held together by tension created in straps wrapped around the frame. The packframe has shoulder straps anchored at both ends to substantially a common point near the bottom and out from the general load bearing area of the packframe. A belt is coupled near the bottom of the packframe to absorb a portion of the load and to stabilize the packframe.

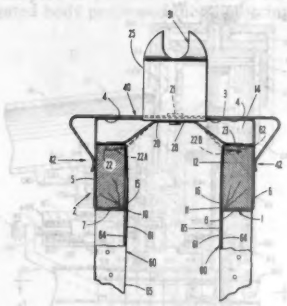
3,563,432
HOLDER

Hadassah K. Sage and Robert W. Johnston, both of Commonwealth Ave., Auburndale, Mass. 02166

Filed Oct. 11, 1968, Ser. No. 766,709
Int. Cl. B65d *61/00*
U.S. Cl. 224—45 10 Claims

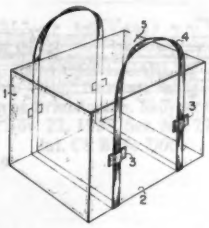
A holder for oil paintings canvas mounted on rectangular sketch frames and the like in which the canvas is stretched over one side of the frame. The holder consists of a pair of C-shaped clamps integrally connected by a continuous web par-

tially formed of the top legs of the C shapes, with the C shapes opening toward one another and having upwardly extending lips extending from the bottom legs which are



adapted to lie in facing relation with faces of the rectangular members. A spring element engages the upper surfaces of the rectangular members and forces it downwardly toward the bottom leg of the C shaped clamps.

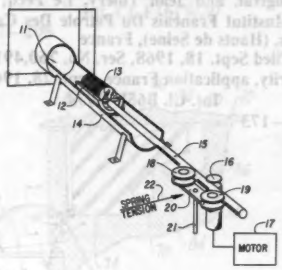
3,563,433
CARRYING DEVICE USABLE IN TWO WAYS
Keiti Yoshiura and Akiko Ito, both of 3,2-chome Ginza-Nishi, Chuo-ku, Tokyo, Japan
Filed May 21, 1969, Ser. No. 826,441
Claims priority, application Japan, May 21, 1968, 43/41,762
Int. Cl. A45c *13/26*
U.S. Cl. 224—45 **3 Claims**



A device for carrying objects having a body portion which in one mode serves as a container supporting the object to be carried and in the other mode serves to cover the object as it is being carried.

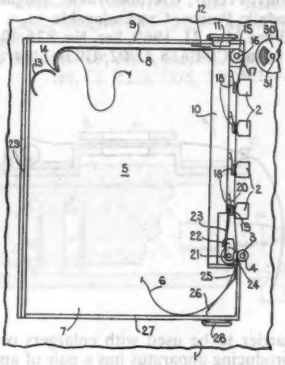
3,563,434
APPARATUS FOR LOADING AND UNLOADING FURNACE
James E. Shriver, Plano, and Gerald M. Streater, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware
Filed Feb. 27, 1969, Ser. No. 802,916
Int. Cl. B65g *39/00*
U.S. Cl. 226—187 **5 Claims**

In order to minimize slip dislocations, the rates of introduction and withdrawal of semiconductor wafers into and from a high temperature furnace are carefully controlled by means of apparatus comprising a conveyor, a pushrod for moving a furnace boat along the conveyor path, and a novel mechanism for driving the pushrod. The mechanism includes



a roller drive and two idler wheels pivotally supported about an axis lying in a common plane with the roller drive axis.

3,563,435
TAPE CASSETTES
Cecil T. Whitehead, Crowthorne, and James E. Wicks, Ashford, England, assignors to International Computers Limited, London, England, a British company
Filed Nov. 12, 1968, Ser. No. 774,635
Claims priority, application Great Britain, Nov. 15, 1967, 51902/67
Int. Cl. G11b *23/12*
U.S. Cl. 226—90 **4 Claims**



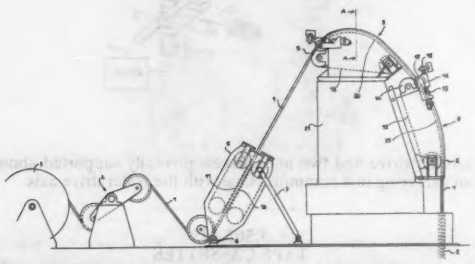
This disclosure relates to a recording tape cassette which is removably mounted on a baseplate assembly, which assembly carries a drive capstan and recording heads. The cassette includes a tape guide means having two concave members separated by a gap at the first corner inside of the boxlike cassette. One concave member extends parallel to a first side of the cassette forming a portion of the tape path. The tape path continues through an opening in the second side of the cassette. A face portion of the second side has mounted thereon a plurality of pressure rollers and pressure pads with the tape traversing the pads and rollers outside the cassette. A tape inlet in the second side is provided such that the tape enters the cassette adjacent a second corner diagonally opposite from the first corner and forms loose folds therein. By engaging the cassette with the baseplate assembly, each pressure pad on the cassette maintains the tape in contact with a corresponding recording head.

3,563,436

ENDLESS CONVEYOR FOR FEEDING A FLEXIBLE ELONGATED MEMBER

Remi Reynard, Port Marly, Michel Chatard, Chatou, Roger Tindy, Bougival, and Jean Thiery, Le Pecq, France, assignors to Institut Francais Du Petrole Des Carburants Et Lubrifiants, (Hauts de Seine), France

Filed Sept. 18, 1968, Ser. No. 760,491
Claims priority, application France, Sept. 28, 1967, 122,723
Int. Cl. B65h *17/34*
U.S. Cl. 226—173 8 Claims



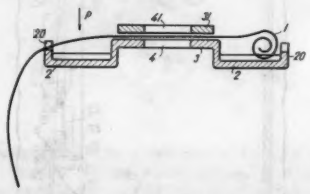
An endless conveyor for feeding a flexible elongated member, comprising endless chain means which are in gripping engagement with the elongated member along a path having a radius of curvature which decreases in the direction of advancement of the endless chain means.

3,563,437

FILM CARRIER

Ladislav Dubny, Prerov, Czechoslovakia, assignor to Meopta, narodni podnik, Prerov, Czechoslovakia

Filed May 21, 1969, Ser. No. 826,494
Int. Cl. B65h *23/02*; G03b *1/44*
U.S. Cl. 226—196 8 Claims



A film carrier to be used with enlargers or other photographic reproducing apparatus has a pair of apertured plates between which the part of the film which is exposed is held. A pair of elongated guides which extend in the direction of film movement are respectively fixed to and extend from opposed ends of one of these plates. Each of these guides has, in a plane normal to the plane of the film between the plates and extending perpendicularly across the guide and the direction of movement of the film strip, a pair of film-engaging portions which respectively engage only opposed edges of the filmstrip and which extend at least in part along a pair of distinct lines that intersect to form a V-shaped configuration.

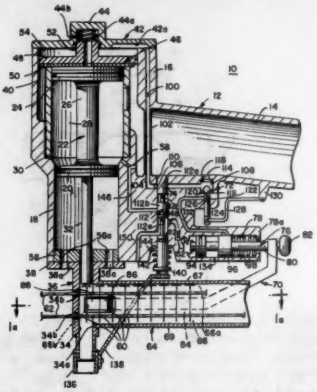
3,563,438

FASTENER DRIVING TOOL

Richard H. Doyle, Mount Prospect, and Edward J. Novak, Franklin Park, Ill., assignors to Fastener Corporation, Franklin Park, Ill., a corporation Illinois

Filed Dec. 5, 1968, Ser. No. 781,433
Int. Cl. B25c *1/04*
U.S. Cl. 227—8 24 Claims

A fastener driving tool comprising a drive track for guiding fasteners as they are driven, a driver slidable in said track and movable on a power stroke to drive fasteners and return stroke in the opposite direction, pusher means for feeding fasteners into the lower end of said drive track and movable between a forward position projecting into said drive track



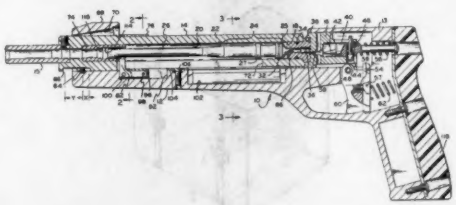
and a rearward position rearwardly retracted therefrom, initiating a power stroke of the driver, and means for retracting said pusher means from said drive track operable to prevent a power stroke of said driver until said pusher means is clear of said drive track.

3,563,439

POWDER ACTUATED TOOL

Raymond V. Pomeroy, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg., a corporation of Oregon

Filed June 18, 1968, Ser. No. 737,900
Int. Cl. B25c *1/14*
U.S. Cl. 227—8 23 Claims



A captive piston type of powder actuated tool is provided with a barrel pivotally engaged by the forward end of the tool housing so that the breech end of the barrel can be upraised into a loading position. A piston retractor is slidably carried on the barrel and includes a member extending through a slot in the barrel for engaging the head of the piston used for moving of a piston into a firing position. The barrel may be pivotally returned to firing position only after the piston retractor has been moved forwardly and out of the way of piston movement in the subsequent firing of the tool.

3,563,440

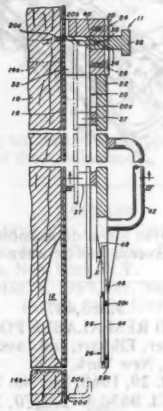
APPARATUS FOR ALIGNING AND DRIVING REINFORCING MEMBERS

Donald J. Stuart, Chesterland, Ohio, assignor to United States Steel Corporation

Original application June 14, 1967, Ser. No. 645,929, now Patent No. 3,475,874, dated Nov. 4, 1969. Divided and this application Sept. 6, 1968, Ser. No. 796,621
Int. Cl. B25c *7/00*
U.S. Cl. 227—147 12 Claims

This invention relates to the strengthening, preservation and extension of the life of wooden poles and, more particu-

larly, to apparatus for aligning and for driving reinforcing members into such wooden poles for this purpose. Such apparatus has an elongated frame having a head end and a tail end, the head end having positioning means adapted to slide on the wooden utility pole and to position the apparatus on the wooden pole. The head end is provided with a leg locating slot adapted to position the pointed end of a first leg of an elongated body portion of the reinforcing member on the



wooden pole to engage a first locating band, the head end being provided with a ram slot in communication with the leg-locating slot. A holding means on the elongated frame secures the reinforcing member in the apparatus and a ram is reciprocable in the ram slot and operable to drive the pointed end of the first leg through the fibrous material and the resinous material and into the wooden pole and to hook the first leg around the first locating band.

3,563,441

TOOL FOR HOLDING AND DRIVING-IN OF CLIPS FOR ELECTRIC CABLES

Kjell Christensen, Oslo, Norway, assignor to A/S Elektrofabrikken Arne Brinchmann, Skoyen, Oslo, Norway

Filed Nov. 22, 1968, Ser. No. 778,232
Int. Cl. B25c *7/00*
U.S. Cl. 227—149 **7 Claims**

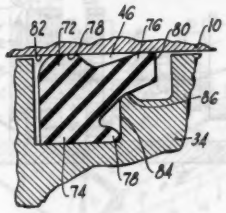
Tool for holding and driving-in of clips of various sizes for electric cables. The tool comprises a handle having a holding and driving-in member attached to one end thereof, and the driving-in member includes on two opposing sides, resilient plates and includes a plurality of stepped grooves in the two sides thereof between the resilient plates. At least the outer of the said grooves being shorter than the width of the driving-in member between the resilient plates.

3,563,442

COMBINATION LIP SEAL AND O-RING

Gerald L. Kretchman, Saint Joseph, Mich., assignor to The Bendix Corporation

Filed Oct. 31, 1968, Ser. No. 772,324
Int. Cl. F16j *9/20*
U.S. Cl. 227—208 **5 Claims**



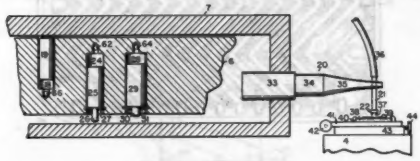
A unique seal is disclosed for use between the piston and cylinder of a fluid motor. A stepped groove is provided in the outer surface of the piston which is defined by inner and intermediate circumferentially extending surfaces. The seal includes a base section disposed in the section of the groove defined by the inner surface, a lip section extending axially from the base section into the section of the groove defined by the intermediate surface, and another section that extends radially from the base section engaging the wall of the bore. The corner defined by the junction of the inner and intermediate surfaces engages one side of the lip section to urge the other side of the latter into sealing engagement with the wall of the bore.

3,563,443

PNEUMATIC FORCE-EXERTING SYSTEM

Donald G. Pedrotti, Cupertino, and Rainer Reimann, Saratoga, Calif., assignors to Hugle Industries, Inc., Sunnyvale, Calif.

Filed Mar. 19, 1969, Ser. No. 808,416
Int. Cl. B23k *1/06, 5/20*
U.S. Cl. 228—1 **9 Claims**



A system for exerting force in ultrasonic or thermocompression bonding of semiconductor structures. Clamping and leveling pneumatic pistons both supply a combined force initially to level deformable contacts upon a semiconductor chip to the plane occupied by connections upon a substrate by pressing the chip and substrate together. The leveling piston is then disengaged. Bonding is subsequently safely accomplished under a force exerted by only the clamping piston. A balance piston free-floats the chip bonding elements.

3,563,444

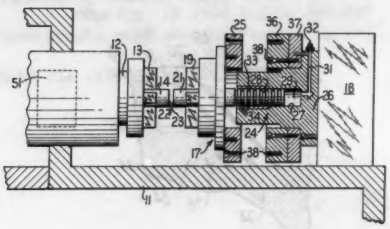
APPARATUS AND METHOD FOR FRICTION WELDING

Calvin D. Loyd, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill., a corporation of California

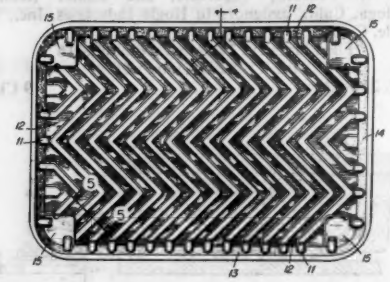
Filed Feb. 12, 1968, Ser. No. 704,873
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **6 Claims**

An inertia welding machine having its nondriven tailstock mounted to permit rotation during welding contact between two weld parts and providing a plurality of flywheels for selective rotational association with the tailstock during

welding. To provide optimum surface velocity between parts having a small weld interface which would normally result in excessive rotational energy in relation to weld requirements, the nondriven tailstock is permitted to rotate with an associated inertia mass to absorb a portion of the energy.



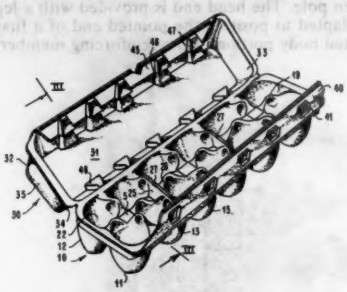
3,563,445
PLASTIC TRAY STRUCTURES
William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation
Filed Sept. 11, 1968, Ser. No. 758,968
Int. Cl. B65d *1/00, 7/42*
U.S. Cl. 229—2.5 **5 Claims**



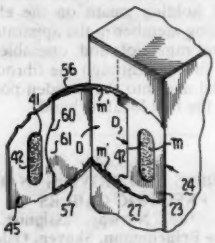
A thermoplastic tray characterized by having a series of valleys and ridges arranged on the surface thereof in a herringbone-type pattern. The depth and width of the valleys and ridges, the longitudinal extent thereof, and the angular relationship of rib segments are substantially uniform and selected to achieve maximum tray rigidity in the longitudinal, transverse and diagonal directions of the tray structure.

3,563,446
MOLDED EGG CARTON STRUCTURE
Connie Lake, Pittsford, and Nicholas D. Commisso, Victor, N.Y., assignors to Mobil Oil Corporation
Filed June 12, 1969, Ser. No. 832,683
Int. Cl. B65d *1/00, 45/00*
U.S. Cl. 229—2.5 **12 Claims**

An egg carton, having two rows of cavities of six each, has the cavities separated from each other longitudinally by integrally formed walls extended upwardly with projecting tips (29), and transversely by at least one transverse wall extending across the carton structure, the walls having sloping sides and meeting at a point intermediate the depth of the cavities to provide for easy egg removal, while cradling the eggs; in one form, the top cover has a depression of sufficient depth to bear against a transverse wall between cavities.



3,563,447
CARTON WITH RESEALABLE POUR OPENING
James H. Katzenmeyer, Elkhart, Ind., assignor to Continental Can Company,Inc., New York, N.Y.
Filed Oct. 29, 1968, Ser. No. 771,397
Int. Cl. B65d *5/72, 5/70, 5/54*
U.S. Cl. 229—17 **10 Claims**

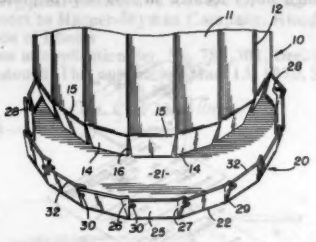


This disclosure relates to a carton which includes a tear panel adapted to be opened to form a pour opening, and is particularly directed to means for releasably securing the tear panel to an underlying wall portion of the carton whereby the tear panel cannot be inadvertently and/or accidentally opened, and the releasable means constitutes a minor surface area of adhesion between the tear panel and the underlying wall portion whereby the tear panel can be readily ruptured relatively evenly and accurately along tear lines thereof.

3,563,448
CONTAINER END STRUCTURE
Thomas E. Croley, Worthington, Ohio, assignor to Corco Inc., Columbus, Ohio
Filed Oct. 7, 1969, Ser. No. 864,323
Int. Cl. B65d *3/04, 13/00*
U.S. Cl. 229—23 **4 Claims**

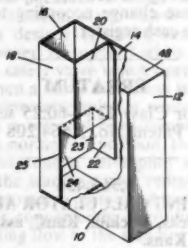
An end structure, either top or bottom, for a container body which is of tubular form and of multisided polygonal transverse cross section. The end closure comprises a flat substantially disclike end with attaching flanges hinged thereto and extending inwardly from the plane thereof, being in number and lateral extent equal to the sides of the body and extending axially inwardly into overlapping relationship thereto. Each flange carries at one of its lateral edges a tab hinged thereto and adapted to overlap the adjacent lateral

edge of the next flange for purposes of sealing and strengthening the joints between adjacent flanges. The



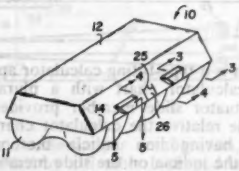
flanges are suitably secured in overlapping relationship to the cooperating sides of the tubular body.

3,563,449
CONTAINER FOR TWO DIFFERENT PRODUCTS
Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.
Filed Mar. 6, 1969, Ser. No. 804,925
Int. Cl. B65d *5/48*
U.S. Cl. 229—27 6 Claims



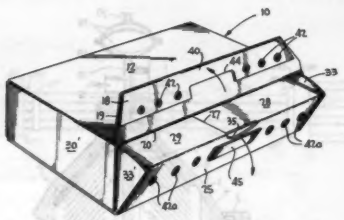
A container for housing two different products is presented wherein the container comprises a primary carton and a secondary carton, with the primary carton being designed to retain the secondary carton in a proportional compartment formed in the primary carton.

3,563,450
MOLDED EGG CARTON
Kurt G. Dahlberg, Rochester, N.Y. (71 Stuyvesant Road, Pittsford, N.Y. 14534)
Continuation of application Ser. No. 770,264, Oct. 24, 1968, now abandoned. This application Jan. 2, 1969, Ser. No. 800,791
Int. Cl. B65d *5/66*
U.S. Cl. 229—44 6 Claims



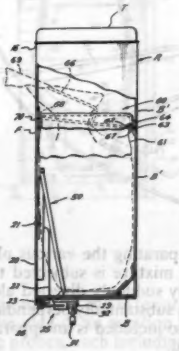
A molded egg carton has a latch flap extending from the base and disposed to tuck inside the cover and interlock with a latch region of the cover, and the flap and cover respectively carry a male member with oblique side surfaces and a female member with gripping surfaces for engaging the male surfaces to latch the cover down.

3,563,451
CARTON WITH TEAR FLAP AND INNER PROMOTIONAL PANELS
Charles W. Rosenburg, Jr., North Tonawanda, N.Y., assignor to F. N. Burt Company, Buffalo, N.Y.
Filed Mar. 25, 1969, Ser. No. 810,097
Int. Cl. B65d *5/54*
U.S. Cl. 229—51 1 Claim



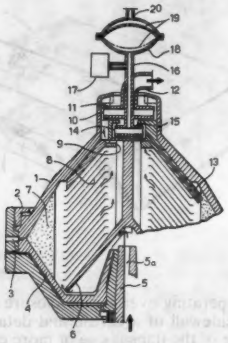
Double cooperating overlapping closure flaps are provided to form one sidewall of a carton and detachably secured to an edge of one of the flaps is one or more coupons, which are longer in extent than the corresponding dimension of the sidewall of the carton; and to obviate obstruction in the insertion of the coupon upon closing the side flaps after the filling of the carton, provision is made for the supplying of the contents through one end of the carton rather than through the side closure. The end closure, for this purpose, comprises overlapping flaps extending from end edges of the front and back panels of the carton and tabs hinged to one of said sidewall flaps and to the opposite sidewall panel of the carton respectively.

3,563,452
WASTE RECEPTACLE
Richard C. Cantella and David Schroeder, Houston, Tex., assignors to Reserv-A-Roll Co., a partnership
Filed May 26, 1969, Ser. No. 827,503
Int. Cl. A65f *1/00*
U.S. Cl. 232—43.2 11 Claims



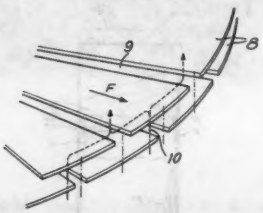
An enclosed, suspended receptacle having an opening in its upper portion for receiving waste with a hinged door in the lower portion of the front of the receptacle and a bottom on the receptacle that is hinged adjacent the rear of the receptacle, the bottom and door having a linkage connecting them so as to move the bottom downwardly relative to the receptacle as the door pivots outwardly away from the receptacle to form a waste exit in the receptacle.

3,563,453
METHOD AND APPARATUS FOR INDICATING SLUDGE LEVEL IN SLUDGE CENTRIFUGE
Paul Kompert, Stockholm, and Carl-Goran Nilson, Tullinge, Sweden, assignors to Alfa-Laval Ab, Tumba, Sweden
Filed Feb. 20, 1969, Ser. No. 800,908
Claims priority, application Sweden, Feb. 23, 1968, 2343/1968
Int. Cl. B04b 11/00
U.S. Cl. 233—20 8 Claims



The centrifugal rotor is provided with a channel extending inwardly from the sludge space toward the axis of the rotor, and a reciprocating movement is imparted to a quantity of liquid in this channel. When the outer end of the channel becomes clogged by accumulated sludge, a substantial change occurs in the resistance to movement of the reciprocating liquid, and this change is sensed to indicate the sludge level.

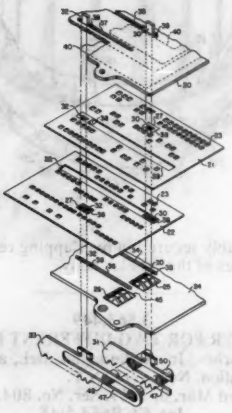
3,563,454
METHOD OF AND APPARATUS FOR SEPARATING THE VARIOUS PHASES OF A FLUID MIXTURE
Pierre H. L. Saget, 36 Avenue de la Grande-Armee, Paris, 16, France
Filed June 18, 1968, Ser. No. 737,897
Claims priority, application France, June 21, 1967, PV111,337
Int. Cl. B04b 7/00
U.S. Cl. 233—44 19 Claims



A method of separating the various phases of a fluid mixture in which the mixture is subjected to a centrifugal field and simultaneously suddenly diverted along the whole of its flow path which is substantially perpendicular to the centrifugal directions. Also included is an apparatus for use in carrying out the method.

3,563,455
MATRIX SWITCH MECHANISM
Louis E. Zurbuchen and Karl C. George, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio, a corporation of Maryland
Filed May 16, 1969, Ser. No. 825,141
Int. Cl. G07g 1/00
U.S. Cl. 235—7 5 Claims

A matrix plate switch controlled by a cash register for use in operating a change-dispensing mechanism which includes a printed circuit board and a switch blade frame separated by a pair of movable mylar matrix plates. The matrix plates are connected to and positioned by rack members in the cash register to align holes located in said matrix plates so as to

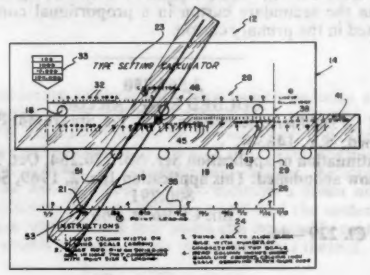


allow switch contacts to sense a predetermined area of the circuit board, thereby selectively operating the change dispenser to dispense change according to the setting of a rack member of the cash register.

ERRATUM

For Class 235—60.25 see:
Patent No. 3,564,208

3,563,456
TYPE-FITTING CALCULATOR APPARATUS
Wendell H. Hendricks, Wichita, Kans., assignor to Robert A. Strong, Wichita, Kans.
Filed Sept. 8, 1969, Ser. No. 855,864
Int. Cl. G06c 3/00
U.S. Cl. 235—89 8 Claims



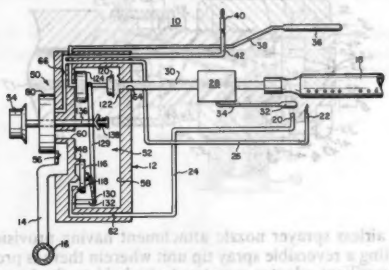
This invention is a type-fitting calculator apparatus having a type-fitting calculator chart with a plurality of indicia thereon; an actuator slide member provided with indicia thereon movable relative the calculator chart; and a swing slide member having line indicia thereon adapted to cooperate with the indicia on the slide member and the calculator chart. More particularly, this invention is a calculator apparatus providing for the logarithmic relationship of various indicia in order to correlate the number of characters in a given newspaper or printed article relative to the size of the type; the amount of spacing between lines; the selection of type; and the width of the particular column so as to ascertain the resultant length or depth of the column to be arrived therefrom to aid in type-setting operations.

3,563,457

OVEN CONTROL WITH SHUTOFF FOR STANDING PILOT

Frank H. Bergquist, Justice, and Richard U. Ives, Flossmoore, Ill., assignors to Harper-Wyman Company, Hinsdale, Ill., a corporation of Illinois

Continuation of application Ser. No. 784,301, Dec. 17, 1968, now abandoned. This application Mar. 13, 1970, Ser. No. 18,376
Int. Cl. F23n *5/06*
U.S. Cl. 236—15 9 Claims



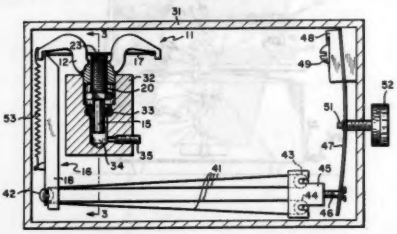
An oven control particularly useful for vehicle-mounted ranges and the like includes a single knob controlling a manual valve and a thermostatic valve. The knob may be moved to select a desired operating temperature and the manual valve is opened to supply fuel to a standing pilot, a control pilot and a safety valve which opens to supply fuel to the oven burner when a flame indication is sensed at the control pilot. The thermostatic valve is controlled by the knob setting to maintain a selected oven temperature. When the knob is turned to a normal off position, the flow through the manual valve to the control valve pilot and safety valve is discontinued, but the standing pilot remains ignited to provide subsequent automatic ignition. An additional off position is provided for conveniently discontinuing all fuel flow to the range, including flow to the standing pilot.

3,563,458

CONDITION CONTROL DEVICE

Ronald L. Martin, Mount Prospect, Ill., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware

Filed Dec. 23, 1968, Ser. No. 785,972
Int. Cl. F15b *5/00*; G05d *22/00*
U.S. Cl. 236—44 8 Claims



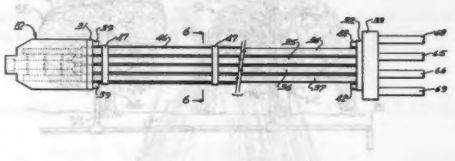
A pneumatic nozzle-flapper combination, the flapper of which is controlled by a flexible L-shaped lever simply supported at one end and at the corner. A nylon ribbon is operably connected to the free end of the lever, and in response to changes in relative humidity that portion of the lever between the supports undergoes a bowing movement with respect to the nozzle. This movement, which is directly in line with the nozzle axis, is utilized to valve air supplied to the nozzle, resulting in an output pressure signal that varies as a function of relative humidity.

3,563,459

DISPERSION METHOD

Glenn E. Kautz, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa., a corporation of Pennsylvania

Original application Dec. 19, 1966, Ser. No. 602,987, now Patent No. 3,462,083. Divided and this application Feb. 10, 1969, Ser. No. 823,215
Int. Cl. B05b *15/06*
U.S. Cl. 239—8 3 Claims



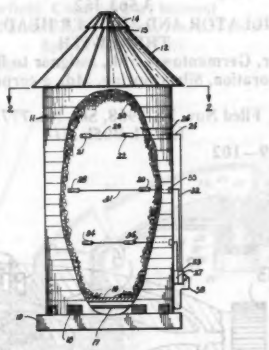
A method for producing polyurethane foam at a remote location. Two streams of polyurethane foam ingredients are delivered to a delivery nozzle in the remote location along with a stream of inert gas. The inert gas creates turbulence in the mixing nozzle for the mixing of the two urethane foam ingredient streams.

3,563,460

GRAIN BIN AERATION CONTROL

Philip L. Nine, Indianapolis, Ind., assignor to Curtis Dyne-Products Corporation, Wistfield, Ind., a corporation of Ohio

Filed Oct. 25, 1968, Ser. No. 770,702
Int. Cl. G05d *23/24*, *7/06*
U.S. Cl. 236—49 7 Claims



A weather-proof housing on the exterior of a grain bin has a socket receiving the plug of an aeration fan under the bin. Temperature sensing probes, each including a thermistor, are disposed at spaced locations in the bin. Bridge circuits in the housing share a manual variable temperature setting resistor, each circuit having a thermistor therein. Unbalance detector transistors are provided for each bridge circuit and responsive to a sensed temperature change beyond a predetermined range to operate a relay to connect 110 volt, 60 cycle per second (Hz) power to the socket to energize the fan.

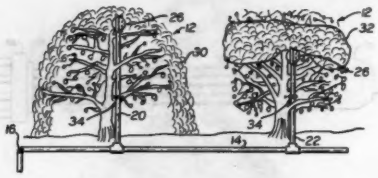
ERRATUM

For Class 239—8 see:
Patent No. 3,563,459

3,563,461
AGRICULTURAL SYSTEM FOR IRRIGATING AND PROTECTING CROPS

Howard W. Cole, Jr., 12 Vale Drive, Mountain Lakes, N.J. 07046, and Alan G. Beattie, 16 Omaha Ave., Rockaway, N.Y. 11693

Filed July 25, 1968, Ser. No. 747,556
Int. Cl. A62c 1/12
U.S. Cl. 239—9 10 Claims

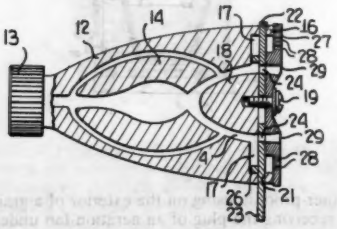


This specification discloses a method and apparatus for a total agricultural control system having piping leading to all of the trees of an orchard, or all of the crops growing in a field, with the system equipped for selectively irrigating, spraying, dusting, and protecting the crops from freezing. The system generates foam which is used to protect the crops from freezing, and this foam provides a vehicle for carrying fertilizers, insecticides and herbicides to the crops. The foam distribution system is used also for water when irrigating and the water can be used to wash foam from the crops after a cold spell is over. The disclosure includes a special type foam generator in which water, air and foaming agent are forced through a turbilizer under controlled conditions, and a diffuser nozzle with a rotating deflector which throws the foam in different directions necessary to spread it over the crops. The specification discloses a special method for protecting heavily pruned trees from frost by expanding foam outwardly over the closely growing branches.

3,563,462
OSCILLATOR AND SHOWER HEAD FOR USE THEREWITH

Peter Bauer, Germantown, Md., assignor to Bowles Engineering Corporation, Silver Spring, Md., a corporation of Maryland

Filed Nov. 21, 1968, Ser. No. 777,694
Int. Cl. B05b 3/14
U.S. Cl. 239—102 22 Claims



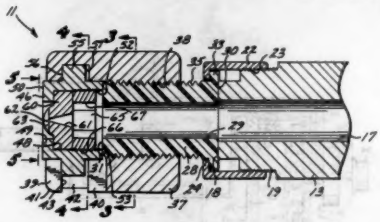
A gas-liquid fluidic oscillator is provided employing liquid as the operating fluid and gas as the control fluid, a pair of feedback channels to opposed central passages are provided, the liquid stream sealing one feedback channel while gas admitted to the other feedback channels produces stream switching.

A shower head is also provided which may operate conventionally as a spray source or by rotation of a lever or a ring on the shower head or other suitable means may be converted to a source of fluid pulses generated by the oscillator located in the head to provide a fluidic massaging device.

3,563,463
SPRAYER NOZZLE

Willis F. Walker, Anaheim, Calif., assignor to Richard N. Gerold, Garden Grove, Calif., a part interest

Filed Dec. 9, 1968, Ser. No. 782,127
Int. Cl. B05b 15/02
U.S. Cl. 239—119 8 Claims

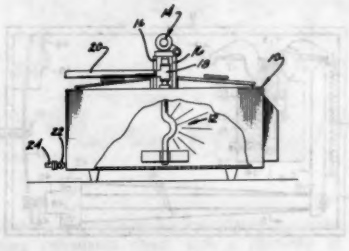


An airless sprayer nozzle attachment having provision for mounting a reversible spray tip unit wherein there is provided a semiresilient adapter member to be held to the barrel of a conventional airless sprayer, and there being threadedly received on the adapter member a collar having at its forward end a receiver section with a cross slot therein opening through one side of the collar, which cross slot receives therein a reversible spray tip unit which includes a retainer ring surrounding an orifice containing spray tip insert, said retainer ring being provided with annular faces on the opposite ends thereof, which faces are adapted to be engaged with and seal against the adjacent end of the adapter member by means of rotating the collar, and yet, the spray tip unit may be quickly removed for reversible purposes by merely rotating the collar slightly to disengage the associated face of the retainer ring from the adapter member and sliding the spray tip unit out of the slot.

3,563,464
SPRAY MEANS FOR BULK TANK WASHERS

George H. Doornbos, Grand Rapids, and John W. Knutson, Spring Lake, Mich., assignors to Werner Machinery Company, Grand Rapids, Mich.

Filed Apr. 6, 1967, Ser. No. 628,873
Int. Cl. B05b 9/00
U.S. Cl. 239—142 8 Claims



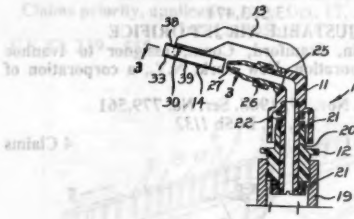
An elongate shaft of generally tubular form which is mountable vertically within a bulk tank from its upper or top end, to be rotatably driven about its longitudinal axis. The shaft has agitator blades attached to its lower extremity, and a central portion of the shaft is laterally offset from the said axis in a smoothly curved U-shaped configuration. The shaft has a series of vertically spaced spray apertures formed therein along said U-shaped offset for spraying liquid pumped through the hollow shaft outwardly therefrom into the interior of the bulk tank over a semicircular arc of approximately 180°

3,563,465

WATER SPRINKLER

Martin Foreman, Merbein, Victoria, Australia

Filed Mar. 24, 1969, Ser. No. 809,609
Claims priority, application Australia, Mar. 26, 1968, Aug. 27, 1968, 35544/68;42647/68
Int. Cl. B05b 3/02
U.S. Cl. 239—230 13 Claims



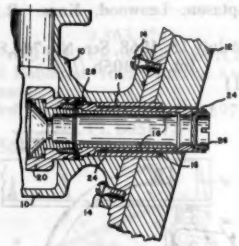
A water sprinkler of the type having an oscillating paddle pivoted to the body in alignment with but displaced from the nozzle to be in the jetstream thereof, the paddle having a primary ramp face between the pivot pin and the nozzle, and a secondary ramp face extending beyond the pivot pin, and having upper and lower wings above and below the ramp faces.

3,563,466

ROCKET MOTOR THRUST VECTOR CONTROL SEAL

Thomas S. Clark, Saratoga, and William S. Kennedy and Gerald E. Kuskie, San Jose, Calif., assignors to the United States of America as represented by the Secretary of the Air Force

Filed Feb. 25, 1969, Ser. No. 802,085
Int. Cl. B64d 33/04
U.S. Cl. 239—265.15 3 Claims



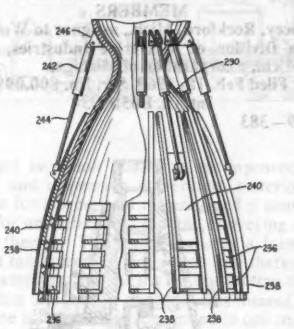
A thrust vector control seal assembly including a tube which fits within the injection port of a rocket motor fluid-injection thrust vector control system and carrying at its inner end, a deformable stainless steel ring that positions the tube and provides frictional torque during assembly. The seal assembly also carries a disposable cap on its outer end providing a seal for the port, preventing fluid passage until it is removed and an insulating liner to protect the tube from the rocket exhaust. Removal of the seal takes place only after predetermined conditions have been met. The necessary condition is the ignition of the solid fuel rocket motor. Other conditions may be a preset time delay determined by conditions of heat and pressure.

3,563,467

ROCKET MOTOR THRUST NOZZLES

Walter R. Marsh, Hopatcong, and Edward J. Davis, Convent, N.J., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Original application Sept. 7, 1966, Ser. No. 579,798, Patent No. 3,469,787. Divided and this application Jan. 21, 1969, Ser. No. 825,458
Int. Cl. B64c 15/02
U.S. Cl. 239—265.17 1 Claim



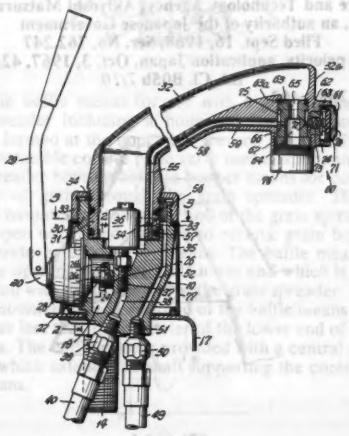
A thrust nozzle for a rocket motor wherein said nozzle is constructed with aperture means for selectively admitting atmospheric air into the interior of said nozzle. The aperture means has movable covers for controlling the flow of air into the nozzle thereby resulting in a more efficient rocket motor when operating in the lower regions of the atmosphere.

3,563,468

MIXING FAUCET

James R. Holzinger, Fairfield, Conn., assignor to Jo-Anne Tallcouch, Fairfield, Conn., a part interest

Filed June 23, 1969, Ser. No. 835,379
Int. Cl. B05b 7/30
U.S. Cl. 239—318 9 Claims



A hot and cold water faucet having a body and a spout having a base which is horizontally swingable within limits on the faucet body which is provided with an inlet connection to receive a conduit for supplying to a detergent conduit in the body liquid detergent from a countermounted refillable detergent container, the spout having embodied within it a detergent conduit leading from the base of the spout to a manually controllable aspirating means at the outlet end of

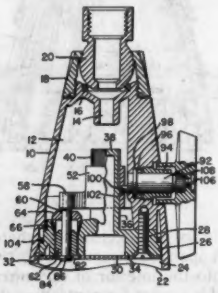
the spout, the base of the spout and the body of the faucet having communicating detergent passages connecting the detergent conduit in the body of the faucet with the detergent conduit in the spout in all positions of the spout on the body within the limits of its horizontal movement at which discharge of detergent is desirable. The faucet is provided with the conventional diverter and connections to a hand-manipulated spray nozzle.

3,563,469

SHOWER HEAD WITH ROTATABLE VALVING MEMBERS

Cecil E. Stacey, Rockford, Mich., assignor to Wolverine Brass Works, a Division of Wolverine Industries, Inc., Grand Rapids, Mich., a corporation of Michigan

Filed Feb. 18, 1969, Ser. No. 800,099
Int. Cl. B05b *1/34*
U.S. Cl. 239—383 **23 Claims**



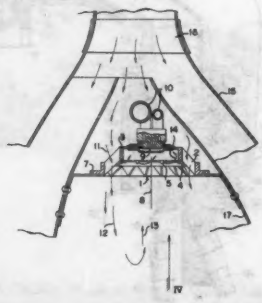
The shower head is characterized by a plurality of rotatable nozzle elements which produce a spray pattern which not only meets existing federal specifications but provides a spray characterized by a highly invigorating hydrotherapeutical effect upon the body of the user.

3,563,470

AIR SWIRLING VANES FOR BURNER

Kunio Suzuki and Teikichi Otsuka, Tokyo, Japan, assignors to The director of National Aerospace Laboratory of Science and Technology Agency, Akiyoshi Matsura, Tokyo, Japan, an authority of the Japanese Government

Filed Sept. 16, 1968, Ser. No. 762,247
Claims priority, application Japan, Oct. 3, 1967, 42/63,241
Int. Cl. B05b *7/10*
U.S. Cl. 239—402 **2 Claims**



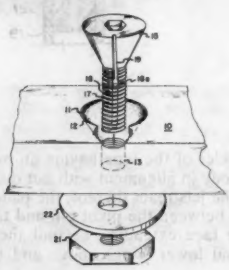
The present invention provides an improved burner performance adapting air-swirling vane device comprising air blades fixedly supported and arranged in cone shape between an inner supporting ring and an outer supporting ring, and a restriction ring connected to the inner ring or integrally formed therewith in such a manner that the outlet area of air outgoing through the blades is smaller than the inlet area of air entering into the blades, whereby the widening of the air reversal zone behind the swirling is restricted to a necessary extent, the flame shape is held small, the stability of the holding flame is improved, the range of an oscillating burning is reduced, and an appropriate counter air flow velocity is reduced in the reversal zone for improving the combustion loading. Furthermore, if necessary, a plurality of small holes are formed along a circumference of substantially the middle of the inner ring integrally formed with the restriction ring or along a circumference of the inside diameter side of the restriction ring when this is connected to the inner ring to allow the flow of air to prevent carbon deposit from being accumulated on the vane device.

3,563,471

ADJUSTABLE AIR JET ORIFICE

Theodore Watkin, Stamford, Conn., assignor to Ivanhoe Research Corporation, New York, N.Y., a corporation of Delaware

Filed Nov. 27, 1968, Ser. No. 779,561
Int. Cl. B05b *1/32*
U.S. Cl. 239—451 **4 Claims**



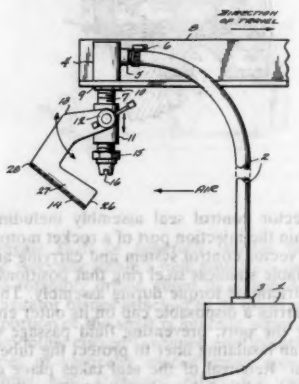
A rotationally adjustable (aimable) orifice or nozzle for fluid under pressure is made by combining a coupling (screw) which has a confined channel along the shank and a slot along the shoulder of the screw. A countersunk hole or aperture in a surface receives the coupling and the countersunk portion of the aperture fits against the shoulder of the coupling to form a channel from the slot. The coupling may be held in the aperture by a nut, for example and the coupling may be turned or rotated in the aperture for directing the flow of fluid exiting from the orifice.

3,563,472

APPARATUS FOR PESTICIDE SPRAYING

Johann S. Skaptason, Leawood, Kans. R.R. 1, Stilwell, Kans.

Filed July 15, 1968, Ser. No. 744,853
Int. Cl. B05b *1/28*
U.S. Cl. 239—511 **4 Claims**



A device, adapted to be used with pesticide spraying equipment, intercepts a portion of the pesticide spray containing

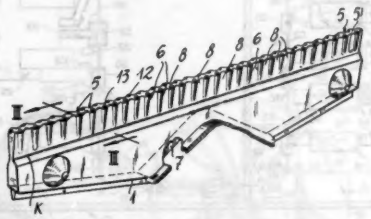
the very small droplets, coalesces said droplets and discharges them as larger desired droplets thus minimizing or preventing pesticide spray drift. A modification will intercept both the very small and the largest range droplets reforming them into medium desired range droplets.

3,563,473

GAS BURNER UNIT

Tredicesimo Luciano Ferroli, San Bonifacio, Italy, assignor to Fer Fabbrica Europea Riscaldamento S.p.A., San Bonifacio, Italy

Filed Oct. 14, 1968, Ser. No. 767,337
Claims priority, application Italy, Oct. 17, 1967, 9979B/67
Int. Cl. B05b *1/14*
U.S. Cl. 239—557 3 Claims



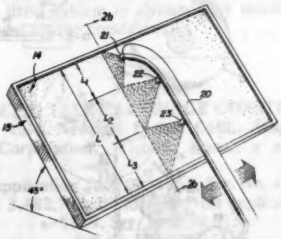
A gas burner unit for providing a discharge of a combustible gas to mix with the surrounding air so as to support a flame. The gas burner unit has gas-receiving and gas-discharging chambers which are defined, in part, between a pair of opposed longitudinally extending sidewalls which define between themselves a narrow longitudinally extending slit through which the gas-receiving and gas-discharging chambers communicate with each other. At the gas-discharging chamber these walls are of an undulatory, wavy configuration and are "in phase" so that the alternating ridges and depressions of one wall are respectively in alignment with the alternating depressions and ridges of the other wall. These walls terminate distant from the slit in elongated wavy edges between which a front wall of the burner unit extends, with this front wall being also of a wavy configuration and being formed with discharge openings through which gas discharges. These openings are respectively situated adjacent the ridges of the walls so as to form two rows of openings with the openings of one row laterally offset from and longitudinally staggered with respect to the openings of the other row.

3,563,474

AIR FILTER WASH DEVICE

Joseph William Robinson, 1632 Midland Ave., Scarborough, Ontario, Canada

Filed Jan. 12, 1968, Ser. No. 697,393
Int. Cl. B05b *1/14*
U.S. Cl. 239—561 6 Claims



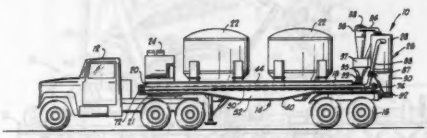
Apparatus for cleaning filter elements comprising a plurality of nozzles for spraying water mounted asymmetrically with respect to the filter element to provide an asymmetric spray pattern whereby optimum utilization of the available water supply is obtained.

3,563,475

TRAILER FOR TRANSPORTING AND DISPENSING PULVERULENT MATERIAL

Robert B. Emery and Richard F. Bailey, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla., a corporation of Delaware

Filed July 15, 1969, Ser. No. 841,910
Int. Cl. A01c *15/04*
U.S. Cl. 239—654 9 Claims



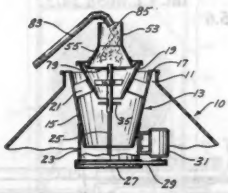
The present invention relates to an improved trailer for transporting and dispensing pulverulent material having at least one bin for storing said material and a source of compressed air for unloading said bin and conveying said material mounted thereon. The trailer includes a frame having a load support rail extending along each side thereof, and having a wheel assembly and means for connecting the frame to a motor vehicle attached to opposite ends thereof. A material conveying line is integrally incorporated in one or both of the load support rails thereby greatly increasing the strength of the frame and obviating the need for supporting the material conveying lines above or below the frame.

3,563,476

GRAIN BAFFLE MEANS

Harlan J. Donelson, Jr., West Highway 330, Marshalltown, Iowa 50158

Filed Sept. 26, 1968, Ser. No. 762,715
Int. Cl. A01c *17/00*
U.S. Cl. 239—668 10 Claims



A grain baffle means for use with a grain spreader, the grain spreader including a housing having a grain intake opening formed at the upper end thereof. A vertically movable and rotatable control plate valve means is mounted in the grain spreader housing below a hopper means for controlling the flow of grain through the grain spreader. The baffle means is mounted on the upper end of the grain spreader and has an open upper end adapted to receive grain being supplied thereto by a conveyor means. The baffle means has a discharge opening provided at its lower end which is in communication with the upper end of the grain spreader. A baffle plate is mounted in the lower end of the baffle means and has a diameter less than the diameter of the lower end of the baffle means. The baffle plate is provided with a central opening through which extends the shaft supporting the control plate valve means.

3,563,477

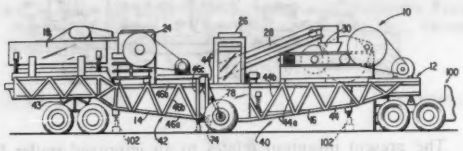
SEPARABLE PORTABLE PROCESSING PLANT

Harry W. Schroeder, Wauwatosa, and Raymond S. Tylinski, Milwaukee, Wis., assignors to Hewitt-Robins Incorporated, Stamford, Conn.

Filed Oct. 8, 1968, Ser. No. 765,856
Int. Cl. B02c *21/02*
U.S. Cl. 241—101 4 Claims

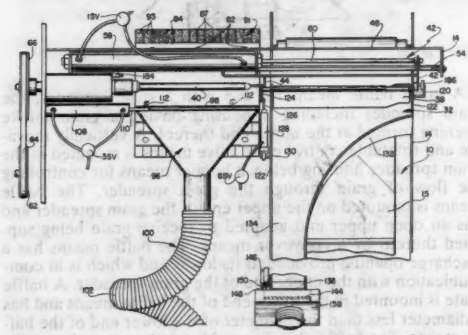
A portable bulk material processing plant is provided which comprises two trailer sections which can be joined

together into a unitary trailer vehicle or which may be separated and formed into individual vehicles for independent highway travel. A retractable wheel is provided on one of the trailer sections so that the section may be supported for wheeled movement during coupling and uncoupling operations of the two sections. The retractable wheel is specifically provided with an adjustable support system which enables the one trailer section to be adjusted vertically relative the second trailer section so as to thereby facilitate verti-



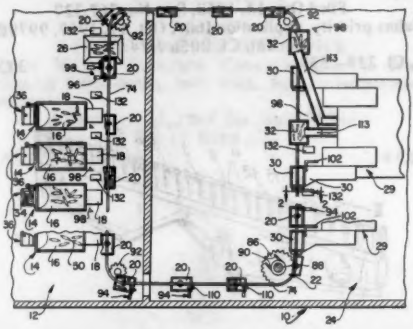
cally aligning the cooperating coupling elements on each of the trailer sections. In addition, guide elements are provided on the trailer sections which serve to indicate proper lateral alignment of the two trailer sections before the coupling on the two trailer sections are brought into proper interfitting engagement. Finally, the processing equipment on each trailer section is positioned such that, when the two sections are joined together, the combination of the equipment on both sections serves to perform a substantially continuous series of operations on the bulk material being handled.

3,563,478
BOBBIN PROCESSING
Charles C. Bell, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I., a corporation of Massachusetts
Filed Jan. 2, 1969, Ser. No. 788,381
Int. Cl. B65h *54/22*
U.S. Cl. 242—35.6 **29 Claims**



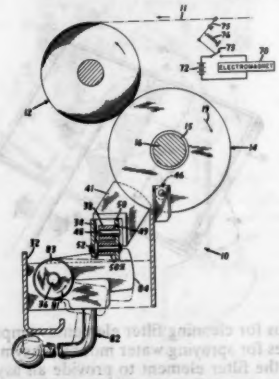
A method and apparatus for locating and withdrawing the free unwinding end of yarn from a bobbin randomly wound, rewinding a portion of the free end about the body of yarn with the remainder of the free end deposited on the bobbin for retention thereon until subsequent retrieval and withdrawal of the free end. Rewinding the end of yarn facilitates initial over end withdrawal of the yarn from the bobbin during subsequent unwinding, as at an automatic winding machine. The bobbin is telescoped onto and off of a horizontal spindle and is then dropped vertically through an adjacent chute. A spiraled suction tube effectively prevents fraying a long length of yarn drawn therethrough.

3,563,479
BOBBIN HANDLING SYSTEM
Charles W. Brouwer, East Greenwich, and Raymond V. Tata, Warwick, R.I., assignors to Leesona Corporation, Warwick, R.I., a corporation of Massachusetts
Continuation-in-part of application Ser. No. 666,625, Sept. 11, 1967, now abandoned. This application June 12, 1968, Ser. No. 736,354
Int. Cl. B65h *54/02*
U.S. Cl. 242—35.5 **9 Claims**



A system for automatically handling bobbins during processing of the bobbins. Various types of bobbins to be processed are stored in a supply area such as a spinning room where each type is separated into units of predetermined quantity. The units are automatically delivered by means of loading hoppers to suspended containers of a conveyor system for transport to bobbin processing apparatus. Following processing, the bobbins pass to another hopper and are returned to the containers and removed from the processing area to the supply area for additional processing such as stripping off residual yarn, sorting and refilling with yarn. A control system operates the handling system by discriminating between the conveyor containers each of which is designated for handling but one type of bobbin, and determining the condition of each container, whether it is empty or carrying bobbins and if it is carrying bobbins whether the bobbins are processed or are to be processed, and whether or not the hoppers are prepared to deliver the bobbins and the processing apparatus ready to receive a unit of bobbins.

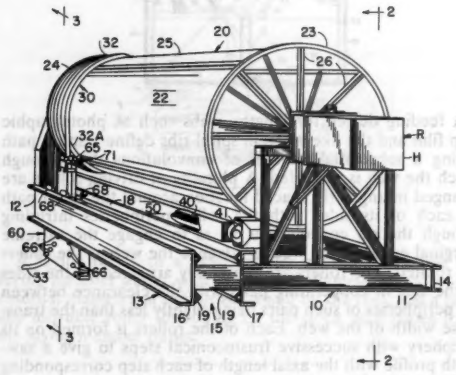
3,563,480
APPARATUS FOR STOPPING A TAKEUP BOBBIN
Charles Crouzet, Roanne, France, assignor to Ateliers Roannais de Constructions Textiles, Roanne, (Loire) France
Filed Sept. 23, 1968, Ser. No. 761,639
Claims priority, application France, Sept. 21, 1967, 121,704
Int. Cl. B65h *63/00*
U.S. Cl. 242—36 **14 Claims**



A system for stopping a bobbin adapted to be rotated by a

drive shaft including a driving roller coupled to the bobbin and journaled on the drive shaft for rotation and axial displacement with respect thereto, a first clutch member mounted on the drive shaft, a second clutch member mounted on the driving roller, and a magnet for locking the first and second clutch members together.

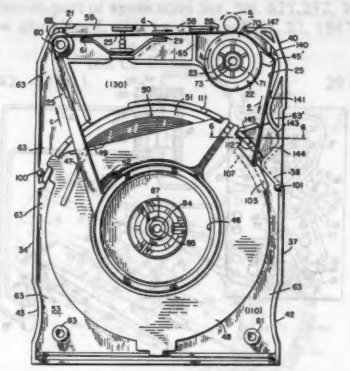
3,563,481
CONTROLLABLY WOUND CABLE TAKEUP REEL
Bernhardt Stahmer, 1509 Chicago St., Omaha, Nebr. 68102
Filed Oct. 3, 1968, Ser. No. 764,883
Int. Cl. B65h *75/00*
U.S. Cl. 242—54 **9 Claims**



This invention relates to spool-type reel apparatuses for the controlled storage, unwinding, and rewinding of elongate flexible cable members, such as electrical conductor conduits and fluids conducting hoses, upon a substantially cylindrical contour of a rotatable spool that is dynamically maintained under constant torque conditions by a braking means. In particular, this invention provides a spool-type reel apparatus wherein one or more elongate flexible cable members are each helically maintained along the spool elongate cylindrical contour during all stages of winding and unwinding, said helically controlled storage being afforded by a novel cable-guide structure adapted to be controllably reciprocated in the horizontal direction with a special shroudable rotatable lead screw unit; sophisticated embodiments of this invention include a smoothing roller component to ensure closely spaced kink-free positioning of the cable helices and include a hydraulic drive system to dynamically maintain the spool under constant torque conditions.

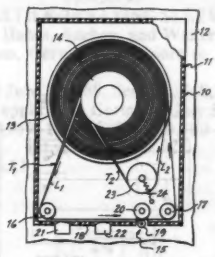
3,563,482
MAGNETIC TAPE CARTRIDGE CONSTRUCTION
Samuel H. Auld, Newport Beach, Calif., assignor to Gates Learjet Corporation, Wichita, Kans., a corporation of Delaware
Original application June 28, 1965, Ser. No. 467,599, now Patent No. 3,482,792. Divided and this application Feb. 13, 1969, Ser. No. 799,015
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 **3 Claims**

The endless magnetic tape cartridge described contains a single reel of tape in spiral array on a rotatable platform. When in play operation, the inner turns are withdrawn causing the reel to rotate with the platform. The tape is transported beyond the transducer and thereupon presented as outer turns onto the reel. The housing of the cartridge is constructed of a mating rectangular base and cover, of tough molded material. Arrangements are herein provided along



the sidewalls of the base and cover to maintain their assembly stable despite rough handling or drop onto a hard floor.

3,563,483
ENDLESS TAPE CARTRIDGE
Masaaki Morita, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Feb. 28, 1969, Ser. No. 803,332
Claims priority, application Japan, Mar. 1, 1968, 43/13270
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 **8 Claims**

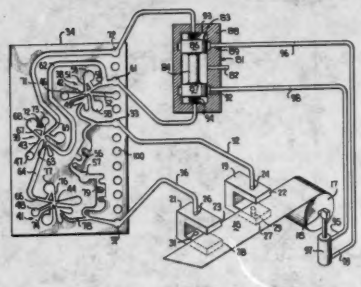


In an endless tape cartridge, an endless magnetic tape and an endless slippery tape are coiled on a rotatable spool with their convolutions arranged alternately, and loops of the magnetic and slippery tapes extending between their innermost and outermost convolutions are guided so that at least a portion of the magnetic tape loop is spaced from the slippery tape loop for engagement individually by a tape drive and also, if desired by one or more magnetic transducers.

3,563,484
EDGE GUIDE
Harry C. Bray, Jr., Takoma Park, Md., assignor to Bowles Engineering Corporation, Silver Spring, Md., a corporation of Maryland
Filed Nov. 21, 1968, Ser. No. 777,696
Int. Cl. B65h *25/08*
U.S. Cl. 242—57.1 **6 Claims**

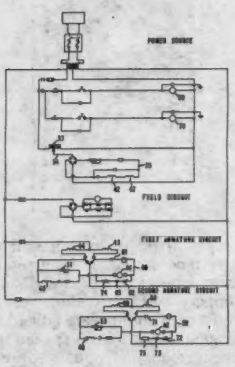
A fluidic circuit and manifold arrangement is provided for achieving control of the position of the edge of a moving web of paper or other strip material. The circuit manifold is provided with a cavity to which pressurized fluid is supplied from an external source. Pressurized fluid is then available to any part of a fluid circuit disposed over the cavity and selec-

tively communicating therewith through a subplate. The fluid circuit, comprising only three fluid elements, senses fluid



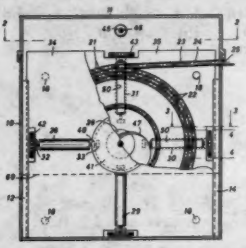
signals supplied by a pair of fluid edge sensors to move the web left or right as commanded by the signals from the sensors.

3,563,485
METHOD OF AND APPARATUS FOR WINDING A WEB OF MATERIAL
Terrance D. Phillips, Richmond, Va., assignor to E.I. duPont de Nemours and Company, Wilmington, Del., a corporation of Delaware
Filed Apr. 30, 1969, Ser. No. 820,488
Int. Cl. B65h *75/34, 59/38, 77/00*
U.S. Cl. 242—64 **4 Claims**



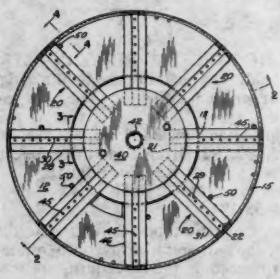
Apparatus for winding a web of material, such as plastic film, including a web tension feedback controller means operatively connected to all of the windup rolls mounted on a turret wherein all such windup rolls respond to a control signal from a web tension-sensing device, whether they are loaded or not. Method of winding a web while maintaining required web tension including controlling the speeds of loaded and next-to-be-loaded windup rolls mounted on a turret by means of a web tension-sensing device whereby the unloaded windup roll is driven at a speed greater than the speed of the loaded windup roll during transfer of the web from the loaded windup roll to the unloaded windup roll.

3,563,486
WEB PROCESSING DEVICE
Louis Achilles Meeussen, Mortsel, and Emile Frans Stievenart, Antwerp, Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium, a Belgian Company
Filed Feb. 8, 1968, Ser. No. 704,168
Claims priority, application Great Britain, Feb. 8, 1967, 6133/67
Int. Cl. B65h *17/12, 17/48*
U.S. Cl. 242—67.1 **3 Claims**



A feeding device for lengthy webs such as photographic strip film and the like wherein spiral ribs define a spiral path having a substantial number of convolutions therethrough which the web is to be fed. A plurality of driving rollers are arranged in angularly spaced location around the spiral path on each of its sides with the roller peripheries intruding through the rib convolutions so as to engage the extreme marginal edges of the web to advance the web as the rollers are rotated. The rollers are preferably arranged on the sides of the ribs in cooperating pairs with the clearance between the peripheries of such pairs being slightly less than the transverse width of the web. Each of the rollers is formed on its periphery with successive frustoconical steps to give a sawtooth profile with the axial length of each step corresponding to the spacing between the ribs, with one step being provided for each convolution of the spiral. The larger diameter of each step is located nearer the center of the spiral so that an increase in tension in the web within any given convolution draws the web towards the larger diameter and thus increases the feeding rate of the web to thereby automatically compensate for tension variations. The rollers are arranged so that their axes of rotation intersect at least one of the spiral convolutions and preferably all of them at an angle extending generally normal to a line drawn tangentially to the spiral at the point of intersection of the corresponding roller axis therewith. The device can be enclosed within a housing which can be arranged to contact the web with a fluid processing medium, for example for photographic development. The device is also useful for storage in the handling of an endless web.

3,563,487
METAL REEL
Everett O. Starratt, Cumberland, R.I., assignor to Wanskuck Company, a corporation of Rhode Island
Filed Oct. 23, 1968, Ser. No. 769,887
Int. Cl. B65h *75/18*
U.S. Cl. 242—77.3 **4 Claims**



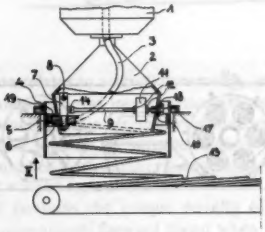
A metal reel having a barrel with heads at each end, which heads are reinforced by a plurality of radially extending ribs,

each rib comprising, in cross section, spaced channels opening toward the head, which channels are connected by an intermediate channel opening outwardly from the head, the inner ends of the ribs being tied together by a disc contacting their outer surfaces with the discs being tied together by a center tube.

3,563,488
REEL FOR LAYING ROD OR WIRE

Georg Bollig, Dusseldorf, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany, a corporation of Germany

Filed Jan. 3, 1969, Ser. No. 788,780
Claims priority, application Austria, Jan. 4, 1968, 106/68
Int. Cl. B21c *47/00*
U.S. Cl. 242—82 **7 Claims**

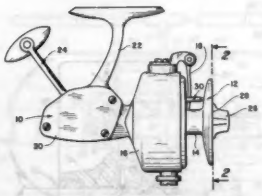


A laying reel with a fixed annular guide surrounding the laying member outlet with an internal diameter equal to the external diameter of the turns formed by the reel, and a radially movable roller for rolling on the stock as it issues from the laying member outlet.

3,563,489
DEPTH-GAUGING MEANS FOR FISHING REELS

Chester L. Coshow, 1113 Center, Collinsville, Okla. 74021

Filed May 7, 1969, Ser. No. 822,463
Int. Cl. A01k *89/00*
U.S. Cl. 242—84.1 **8 Claims**

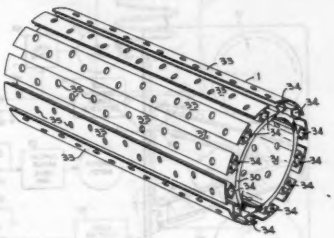


A fishing reel including metering means for paying-out predetermined lengths of line, comprising a rotatable reel having a peripheral surface upon which line can be wound, and a gauge member removably secured on the rotatable spool spaced from the peripheral surface thereof whereby the length of line subsequently payable from the spool when the gauge member is in position thereon is limited to those line windings supported by the gauge member. In addition, an open face type spinning reel comprising a normally stationary spool revolvable against a friction brake and including a gauge member removably secured on the spool in spaced relationship with the peripheral surface thereof whereby subsequent line payed from the spool will be limited to the line windings supported by the gauge member.

3,563,490
YARN TUBE

Max Steven Berger, Water Street Road, Collegeville, Pa. 19426

Continuation-in-part of application Ser. No. 621,252, Mar. 7, 1967, now abandoned. This application Sept. 22, 1967, Ser. No. 695,299
Int. Cl. B65h *75/24*
U.S. Cl. 242—118.11 **29 Claims**

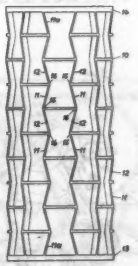


A radially flexible and porous yarn tube is employed as the core for a yarn package wound on an uptwister in the last step of a throwing sequence. Without prior shrinking or rewinding, this yarn package is dyed, the yarn tube accommodating the forces attendant the shrinkage of the yarn. The tube may be cylindrical or conic and has a plurality of axial slats surrounding it, each slat being attached by a member capable of undergoing pantographic distension. A plurality of radial holds through the tubes and slats render the core porous.

3,563,491
TEXTILE-TREATING SLEEVE

Gerhard Herbert Hahm, Aachen, and Walter Henning, Hoengen near Aachen, Germany, assignors to Joseph Zimmerman

Filed July 3, 1969, Ser. No. 848,379
Claims priority, application Germany, July 5, 1968, Jan. 7, 1969, 1,760,818;1,900,500
Int. Cl. B65h *75/02*
U.S. Cl. 242—118.11 **12 Claims**



A textile-treating sleeve made of thermoplastics material has a cylindrical or conical shell comprising consecutive rows of rigid ring sections. These ring sections extend circumferentially and are spaced apart in the axial and transverse directions. The ring sections of adjacent rows are offset relative to one another, and the ends of ring sections of adjacent rows are connected by longitudinal webs which are elastically and plastically yieldable in circumferential direction when axial and/or radial pressure is applied to the sleeve.

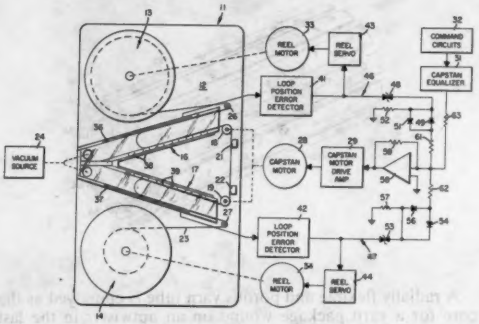
3,563,492
CAPSTAN ACCELERATION CONTROL SYSTEM FOR WIDEBAND INSTRUMENTATION MAGNETIC TAPE TRANSPORTS

Herman A. Ferrier, Jr., San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of application Ser. No. 663,691, Mar. 28, 1967, now abandoned. This application Sept. 10, 1969, Ser. No. 863,666

Int. Cl. G11b *15/46, 15/58, 23/12*

U.S. Cl. 242—184 **7 Claims**



A system for controlling capstan acceleration to prevent the tape loops from pulling out of or bottoming in the vacuum chambers during extreme speed change modes such as stop, start, and fast wind. The system is particularly applicable where relatively small, low power supply and takeup reel motors, and relatively short vacuum chambers are employed in conjunction with a low inertia, high acceleration, capstan system capable of detrimentally altering tape loop position in the vacuum chambers before the reel servos can effect equalization.

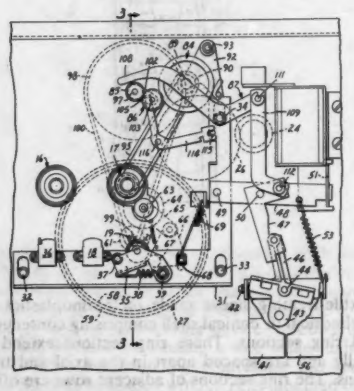
3,563,493
END OF TAPE SENSING APPARATUS

Richard C. Bielke, Minneapolis, and Leif O. Erickson, Little Canada, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware

Filed June 11, 1969, Ser. No. 832,147

Int. Cl. B65h *59/38;* **G03b** *1/04;* **G11b** *15/32*

U.S. Cl. 242—186 **10 Claims**



Apparatus for deactivating a web transporting mechanism in response to retardation in the movement of a web. The retarded movement of the web is sensed by rotation of a spindle associated with a spool contacting the web and the rotation of the spindle relative to a continuously rotatable member drives a sensing member to maintain the sensing member in a first position when the web is normally transported and to drive the sensing member to a second sensing position when the web movement is retarded. Upon movement of the sensing member the web transporting mechanism is deactivated.

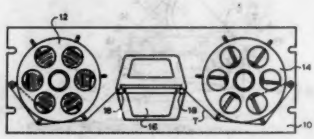
3,563,494
MOVING TAPE STORAGE UNIT

Paul K. Hokkinen, Toronto, Ontario, Calif., assignor to Ferranti-Packard Limited, Toronto, Ontario, Calif.

Filed Dec. 23, 1968, Ser. No. 785,994

Int. Cl. B65h *59/38;* **G03b** *1/00;* **G11b** *15/43*

U.S. Cl. 242—190 **6 Claims**



A tape guide frame surrounds a tape supply or takeup spool and is biased in the tape unwinding direction for spool rotation. The frame is designed to store tape to be wound on or wound off the spool, in amounts of tape varying with the movement of the frame in accord with said bias. The movement of the frame may actuate controls for the spool drive to reduce the tape stored.

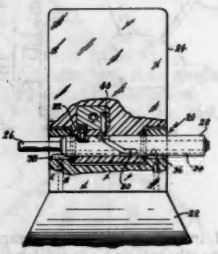
3,563,495
POWER OPERATED FOLDING WING FOR ROCKETS AND MISSILES

Bernard B. Korn, West Los Angeles, Calif., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Feb. 3, 1969, Ser. No. 795,798

Int. Cl. F42b *13/22*

U.S. Cl. 244—3.29 **3 Claims**



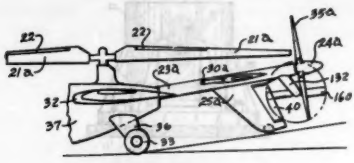
A power operated folding wing including a hinged wing mounted on a rocket or missile, a slidable cylindrically shaped member having grooves therein and mating projections in the rocket and a cam with accelerating and decelerating slopes. Pneumatic or hydraulic means mounted at the end of the cylinder to cause it to slide and cam followers fixed to the wing riding on the cam to cause the wing to extend or collapse.

3,563,496

COMPOUND HELICOPTER

Daniel R. Zuck, 1427 Beaver St., San Fernando, Calif. 91340

Filed June 12, 1967, Ser. No. 645,861
Int. Cl. B64c 27/22
U.S. Cl. 244—7 13 Claims



This invention relates to aircraft commonly referred to as a Compound Helicopter, and more particularly to certain new and useful improvements in aircraft which are capable of vertical takeoff and landing at zero horizontal velocity, and which are capable of horizontal cruising flight similar to the conventionally winged type airplanes.

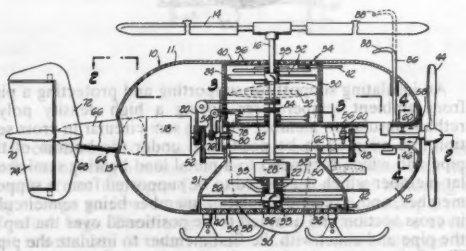
This aircraft contains the unique novelty of utilizing the propeller for conventional forward thrust when the aircraft is in the high speed forward flight configuration, and conversely utilizing the same propeller in combination with a cyclic pitch control to the said propeller and a controllable slotted fin to produce a variable aerodynamic force 90° to the propeller axis at the command of the pilot in opposition to the rotor torque when the aircraft hovers or takes off and lands vertically in the helicopter configuration.

3,563,497

FLIGHT CONTROL MEANS FOR ROTORCRAFT

Gene C. Holmes, 5708 Briarcliff Road, Los Angeles, Calif.

Filed Jan. 6, 1969, Ser. No. 789,164
Int. Cl. B64c 29/00
U.S. Cl. 244—12 8 Claims



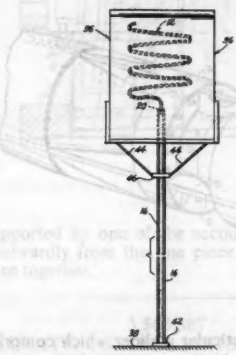
The present invention provides an improved control system for rotorcraft such as helicopters, autogiros or similar aircraft having both a rotor and a propeller whereby the craft may also be capable of flight in the manner of a fixed wing aircraft with the rotor operative or held stationary. The invention includes means for introducing and discharging air under pressure upon the control surfaces whether the aircraft is under power or not so that good control of the craft is maintained even in the event of a power failure. The invention further includes air ducting means to augment the ascent and descent capabilities of the craft.

3,563,498

DEVICE FOR APPLYING A RESTRAINING AND STABILIZING FORCE TO A MOVING OBJECT

James E. Haile, Hendersonville, N.C., assignor to Stencel Aero Engineering Corporation, Asheville, N.C., a corporation of North Carolina

Filed Nov. 22, 1968, Ser. No. 778,244
Int. Cl. B64d 25/00
U.S. Cl. 244—122 3 Claims



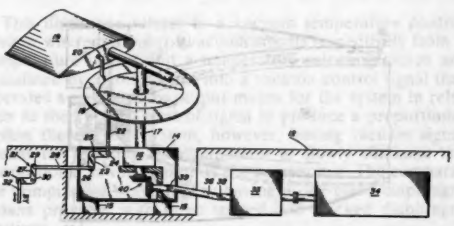
A device for applying a restraining and stabilizing force to a first object, such as an ejection seat, as it moves away from a second object, such as an aircraft. The device itself includes an elongated rendable web means connected between the first and second objects and an element secured to one of the objects and projecting at least partially through the web means to progressively rend the web means as the first object moves away from the second object. The rendering of the web means provides a restraining force which opposes movement of the first object away from the second object and also provides a stabilizing effect on the first object.

3,563,499

MECHANISM TO TRANSFER ENGINE TORQUE AND CONTROL MOTION ACROSS HELICOPTER ROTOR VIBRATION ISOLATOR

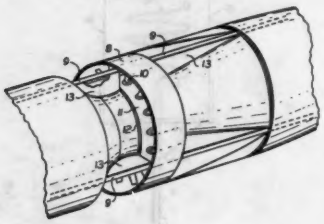
James E. Dueweke, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 15, 1969, Ser. No. 791,285
Int. Cl. B64c 27/74
U.S. Cl. 244—17.27 3 Claims



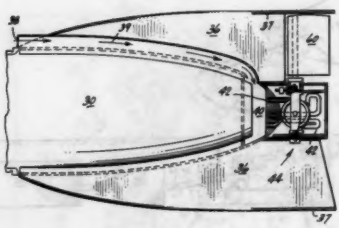
A helicopter rotor is attached to a structural member which is in turn mounted on an airframe by vibration isolators which enable the rotor and structural member to vibrate in a vertical plane and do not transmit these vibrations to the airframe. A linkage system having one bell crank pivoted on the structural member and another bell crank pivoted on the airframe is used to transfer control motion to the helicopter rotor with a minimum of interference from the vibration of the rotor and structural member. Universal joints are used to transfer engine torque from the engine mounted on the airframe to the vibrating rotor.

3,563,500
AEROPLANE, IN PARTICULAR GLIDER WITH PROPELLER AUXILIARY DRIVE
Hans-Otto Fischer, Kickenstrasse 44a, Neersen near Dusseldorf, Germany
Filed Oct. 21, 1968, Ser. No. 769,211
Int. Cl. B64c *11/00*
U.S. Cl. 244—65 **8 Claims**



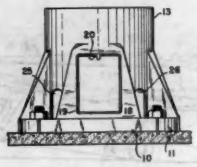
An airplane, in particular a glider which comprises an extended fuselage of circular cross section and a propeller disposed in the fuselage and rotating as an auxiliary drive about the longitudinal axis of the fuselage. The latter is crosswise divided in its center to form two fuselage parts. Planking sheets are provided which have an elongation and longitudinal carriers or frames, extending in the elongation, are uniformly distributed about the periphery of the fuselage, holding together the two fuselage parts spaced apart from each other to define a space therebetween. Means for rotating the propeller in the space are arranged and the planking sheets forming an inward restriction in front of and behind the propeller.

3,563,501
AIRBORNE VEHICLE
Homer Jensen, Elkins Park, Pa., assignor to Aero Service Corporation, Philadelphia, Pa., a corporation of Delaware
Filed Nov. 25, 1968, Ser. No. 778,427
Int. Cl. B64c *17/06*
U.S. Cl. 244—79 **3 Claims**



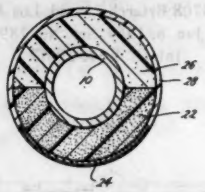
A vehicle for use in airborne geophysical surveys to convey instrumentation for measuring geophysical variables. A single axis of the freedom gyroscope is affixed to the vehicle and has an aerodynamic control surface attached to its gimbal mount so that the precession of the gyroscope, as a consequence of changing roll attitude, moves the control surface, resulting in a movement of the vehicle sufficient to return it to a predetermined path.

3,563,502
ANCHOR BASE FOR LIGHTING STANDARDS
Arthur R. Dayson, Hendersonville, Tenn., assignor to Harsco Corporation, Harrisburg, Pa.
Filed Dec. 4, 1968, Ser. No. 781,108
Int. Cl. E04h *12/22*
U.S. Cl. 248—44 **3 Claims**



An anchor base for lighting or other standards has a cast construction including a hollow cylinder for receiving the standard and a generally square base supporting the cylinder. Four integrally cast buttresses extend from the base partway up the cylinder to strengthen the same. The base is open interiorally and slots for holddown bolts extend from outside of the cylinder through the base and through the cylinder and open into the open base. Stops are provided within the cylinder for limiting the telescoping movement of the standard.

3,563,503
PIPE INSULATION SUPPORT
Charles C. Lancaster, 6140 Grape, Houston, Tex.
Filed Nov. 29, 1968, Ser. No. 780,021
Int. Cl. F16l *3/02*
U.S. Cl. 248—49 **5 Claims**

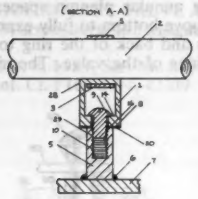


An insulating support for supporting and protecting a pipe from ambient temperatures having a high density polyurethane insulation member which is semicircular in cross section and adapted to be positioned under the bottom of the pipe and which is bonded to a metal load-bearing semicircular member which is adapted to be supported from a support member, and a second insulation member being semicircular in cross section and adapted to be positioned over the top of the pipe and coact with the first member to insulate the pipe. The first member having a density of at least 7 pounds per cubic foot. The second member being polyurethane having a density of approximately 2 pounds per cubic foot. A vapor cover surrounding and bonded to the first and second members and the load bearing member.

3,563,504
DIE-CAST CABLE PANS
Harry K. Gordon, 402 N. 46th, and Dennis H. Baerwald, 773 N. 74th, Seattle, Wash.
Filed Mar. 5, 1969, Ser. No. 804,545
Int. Cl. F16l *3/22*
U.S. Cl. 248—68 **3 Claims**

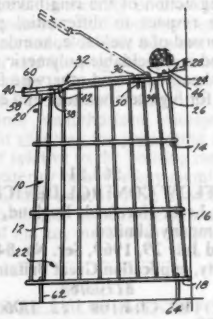
This invention relates to cable and pipe supporting hangers and hanger supports. The pan is die-cast and is of rectangular

cross section at its middle with sides sloping upward from the bottom of the middle portion to form a top portion upon



which the cable or pipe rests. The bottom of the pan is attached to a stand off tube which may be welded to a supporting surface.

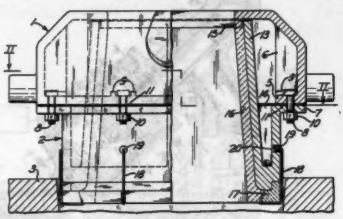
3,563,505
REFUSE BAG HOLDER
Wesley Burton Langley, Rte. 3, Elizabethtown, Ky. 42701
Filed Oct. 13, 1969, Ser. No. 865,879
Int. Cl. B65b *67/12*
U.S. Cl. 248—101 **10 Claims**



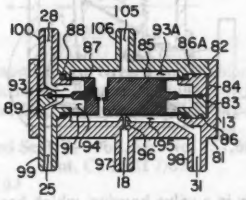
A refuse bag holder having a frame member with two open ends for holding a refuse bag in an upright position with the mouth of the bag open for receiving refuse and including a bag storage member mounted on the frame for storing a roll of refuse bags. The frame member is provided with a cover that is rotatably mounted on the frame member adjacent to the bag storage member for receiving and clamping a bag located on an end of the bag roll and for enabling the clamped bag to cover one of the open ends of the frame member in a flytight manner when the cover is in its closed position.

3,563,506
INGOT MOLD HOT TOP CASING
Joseph Perri, Coraopolis, Pa., assignor to The Susquehanna Corporation, Chicago, Ill., a corporation of Delaware
Filed Jan. 15, 1968, Ser. No. 698,014
Int. Cl. B22d *7/10*
U.S. Cl. 249—197 **3 Claims**

A hot top casing is formed from a metal casting provided with a central vertical opening, the casting being divided into separate upper and lower ringlike sections. The sidewall of the opening is one piece from top to bottom of the casting and is supported by one of the sections. Fastening means, located outwardly from the one piece wall, rigidly connect the sections together.



3,563,507
PNEUMATIC CONTROL SYSTEM AND PARTS THEREFOR OR THE LIKE
Larry V. Nisley, Klaus P. Mueller, and Kenneth G. Kreuter, Goshen, Ind., assignors to Robertshaw Controls Company, Richmond, Va., a corporation of Delaware
Continuation-in-part of application Ser. No. 719,495, Apr. 8, 1968. This application Nov. 1, 1968, Ser. No. 772,788
Int. Cl. F16k *7/17*
U.S. Cl. 251—61 **16 Claims**

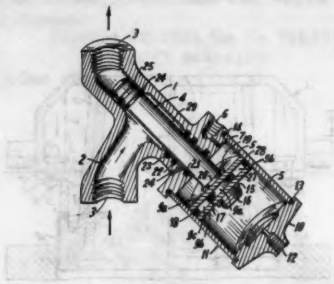


This disclosure relates to a vacuum temperature control system wherein a pair of vacuum signals respectively from a temperature sensor and a temperature selecting means are translated by a comparator into a vacuum control signal that operates a temperature output means for the system in relation to the vacuum control signal to produce a proportional action thereof, the system, however, having vacuum signal means for resetting the comparator to slowly eliminate the proportional action caused by the comparator. The comparator comprises a valve means having a one-piece diaphragm means provided with three spaced and stacked diaphragm portions.

3,563,508
VALVE INCLUDING PISTON WITH SPACED APART PLATES
Bruce L. DeLorenzo, 124 Fenner Ave., Clifton, N.J. 07013
Continuation-in-part of application Ser. No. 547,560, May 4, 1966, now abandoned. This application Dec. 13, 1968, Ser. No. 783,666
Int. Cl. F16k *31/12*
U.S. Cl. 251—63.5 **9 Claims**

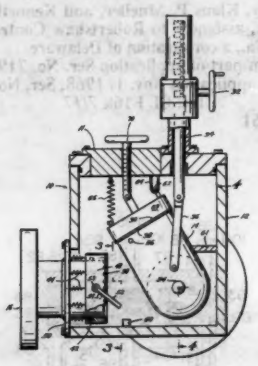
A valve arrangement has a piston integral with the plunger.

The walls of the housing surrounding the plunger are provided with fluidtight seals. The walls of the housing adjacent



the seals are cutback. The plunger may terminate in a disc formed from two spaced apart plates.

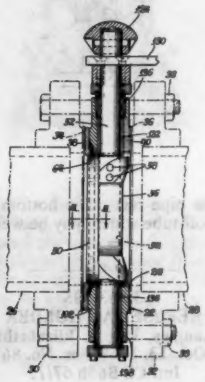
3,563,509
VALVE
Clyde H. Chronister, 4 Kings Row, Rte. 14, Houston, Tex.
Filed July 7, 1969, Ser. No. 839,280
Int. Cl. F16k *1/02*
U.S. Cl. 251—159 **13 Claims**



A pipe elbow in a valve housing, which has an inlet and an outlet, with the first end of the elbow rotatably connected to the outlet and a trunnion axially aligned with the outlet whereby the elbow may be rotated about the trunnion and first end to bring the second end into and out of alignment with the inlet. Seal means for closing off the second end when the second end is moved out of alignment with the inlet into a valve closed position. A collar slidably engaging the inlet with engaging means actuated by the elbow upon movement of the second end into alignment with the inlet for moving the collar towards and sealing with the pipe second end. Seal means for closing said valve being pivotally supported at an edge remote from the inlet and spring means connected to the edge nearest the inlet for normally retracting the seal from the second end of the pipe and means operable outside of the housing for moving the seal towards and away from the second end of the pipe.

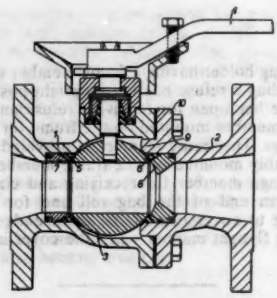
3,563,510
VALVE SEALED BY CALKING RING ANCHORED IN SUPPORT GROOVE
Werner K. Priese, Barrington, Ill., assignor to Hills-McCanna Company, Carpentersville, Ill.
Filed Aug. 6, 1969, Ser. No. 848,008
Int. Cl. F16k *5/14*
U.S. Cl. 251—173 **16 Claims**

A valve that is sealed, when closed, by the calking action against a sealing surface of a dynamic calking ring held by an integral anchoring flange in an annular support groove closely confronting the sealing surface. Relatively thin in relation to the calking ring, the anchoring flange is anchored in an annular position generally perpendicular to a transverse tangent to the sealing surface. The ring support groove is dimensioned laterally in relation to the ring to define on opposite sides of the ring annular plenum spaces opening into the groove to the groove bottom to fully expose the corresponding side surfaces and back of the ring to fluid pressures on the respective sides of the valve. The side surfaces of the



groove confront the sealing surface at angles lacking any material degree of obtuseness all to the end that mechanical initial sealing of the valve is intensified by a fluid pressure energized calking action of the ring having a maximized effectiveness with respect to differential pressure in either direction. Comprised of a yieldable, annular pressure sustaining core sheathed in a yieldable polymeric material, the calking ring can be sheathed in and otherwise formed partially or wholly of metal for high temperature and other special applications.

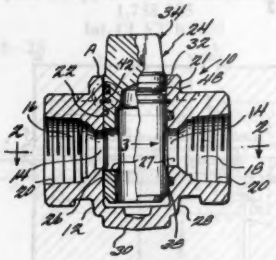
3,563,511
FLOW CONTROL DEVICES
Herbert Bentley-Leek, Hereford, England, assignor to Saunders Valve Company Limited
Filed July 29, 1969, Ser. No. 845,802
Claims priority, application Great Britain, Aug. 7, 1968, 37708/68
Int. Cl. F16k *5/12, 5/06*
U.S. Cl. 251—209 **9 Claims**



A plug-cock-type flow control valve wherein one of the ports of the bore of the plug coacts with a member having an aperture which is asymmetrically shaped with respect to the axis of the plug bore, the apertured member being settable in any one of a number of different angular positions relative to the plug bore axis to provide different patterns of develop-

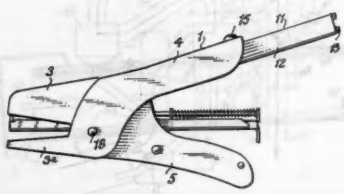
ment of the effective flow passage through the valve as the plug is rotated between the closed and open positions of the valve.

3,563,512
TAMPERPROOF ROTARY VALVE ASSEMBLY
William L. Hauffe, Warrensburg, Ill., assignor to Mueller Co., Decatur, Ill.
Filed Dec. 8, 1969, Ser. No. 883,125
Int. Cl. F16k 5/04, 41/00
U.S. Cl. 251—312 11 Claims



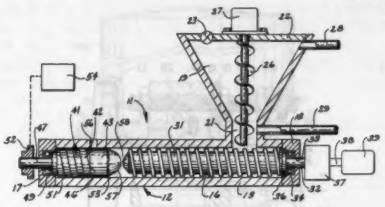
A rotary valve assembly having a valve housing member with a flow passage therethrough and a key member which includes a valve member for coacting with valve seat means in the housing member. The key member is rotatable in a key seat in the housing member and means are provided to prevent unauthorized disassembly of the key member from the valve housing member. Additionally, means are provided to protect against corrosion at least between the key member and the key seat of said housing member whereby easy turning of the key member is insured throughout the life of the valve assembly. The means for making the valve assembly tamperproof against unauthorized disassembly includes utilization of a split snapring for preventing axial movement of the key member relative to the housing member and inaccessible from the exterior once the key member is assembled in the valve. A seal and anticorrosive coatings on pertinent parts of the valve assembly protect the split snapring and insure easy turning of the key member in its key seat.

3,563,513
STAPLER REMOVER ATTACHMENTS FOR STAPLING MACHINES
Arthur L. Rubin, 3801 S. Ocean Drive, and Harry Radzinsky, 2501 S. Ocean Drive, both of Hollywood, Fla. 33020
Filed Dec. 18, 1968, Ser. No. 784,600
Int. Cl. B25c 11/00
U.S. Cl. 254—28 7 Claims



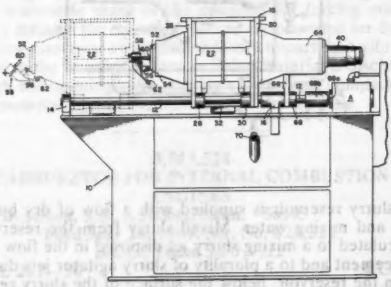
A staple-applying and removing apparatus comprising a stapler provided with an operating handle and a staple remover housed in the handle and attached thereto and adapted to be manually projected from the handle without detaching it therefrom, into operating position.

3,563,514
PLASTICIZER WITH FULL DIAMETER ROTOR
Robert Shattuck, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill., a corporation of Delaware
Filed Mar. 11, 1968, Ser. No. 712,175
Int. Cl. B01f 7/08
U.S. Cl. 259—9 7 Claims



A plasticizing apparatus comprising a feed barrel having a constant diameter opening therethrough, the feed barrel having a rotatable feed screw mounted at one end thereof and a rotatably driven plasticizing element mounted in the other end thereof. The feed screw and the rotor both have a diameter substantially equal to the interior diameter of the feed barrel opening and are coaxially positioned within the opening so as to define a compression and plasticizing zone. The end of the rotor adjacent the feed screw is provided with a steep conical face thereon for coacting with the plastic material for plasticizing same. The screw feeds particulate plastic material into the compression zone whereby the powder is highly compacted and compressed within this zone, the compressed powder thus being forced against the face of the rotor so as to plasticize the material. Passageways are provided for withdrawing the volatiles from the plasticizing region, the volatiles being withdrawn through the compacted and compressed material within the compression zone.

3,563,515
MIXING MACHINE
William D. Chapman, Au Gres, Leon Yablonski, Owen W. Rohn, and Richard J. Balazer, Saginaw, Mich., assignors to Baker Perkins, Inc., Saginaw, Mich., a corporation of New York
Filed Sept. 5, 1968, Ser. No. 757,603
Int. Cl. B01f 7/02
U.S. Cl. 259—104 17 Claims

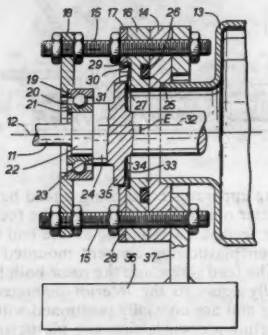


A mixing machine including a generally horizontally disposed mixing trough having a pair of independently driven mixing elements journaled in one end wall of the mixing trough. The opposite end wall of the mixing trough may be moved relative to the first-mentioned end wall and mixing elements for purposes of cleaning. Also, the assembly of the mixing trough, mixing elements, and associated drive means may be tilted relative to the remainder of the machine for emptying the mixed constituents therefrom.

3,563,516
SEALS FOR ROTATABLE SHAFTS

William Paul White, Whitby, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 25, 1969, Ser. No. 852,831
Claims priority, application Great Britain, Sept. 5, 1968, 42369/68
Int. Cl. B01f 7/00; F16j 15/34
U.S. Cl. 259—106 5 Claims

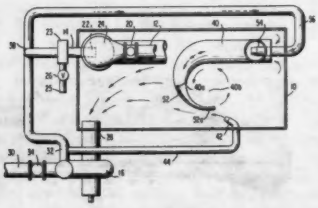


A seal between a shaft and a housing relative to which the shaft is rotatable comprises a resilient washer one of whose two peripheral edges is fixed fluid-tightly to the shaft or the housing the other edge being in rotatable contact with the housing or the shaft. The longitudinal axis of the washer is disposed parallel to, but is offset from, the axis of rotation of the shaft.

3,563,517
CEMENT SLURRY MIXING SYSTEM

Donald W. Harriman, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 25, 1969, Ser. No. 819,265
Int. Cl. 28c 5/02
U.S. Cl. 259—148 20 Claims



A slurry reservoir is supplied with a flow of dry bulk cement and mixing water. Mixed slurry from the reservoir is recirculated to a mixing slurry jet disposed in the flow of dry bulk cement and to a plurality of slurry agitator jets disposed within the reservoir, below the surface of the slurry retained therein. The mixing slurry jet cooperates with a mixing water inlet to thoroughly mix the incoming dry bulk cement before the dry bulk cement is added to the slurry in the reservoir. An eductor member, formed with an arcuate vane disposed on a discharge end thereof, may be disposed within the reservoir for providing additional swirling agitation to the body of slurry retained therein. A density measuring device may be connected within the slurry mixing system and used as an indicator by an operator as he varies the inflow of dry cement and water in order to control the final density and quantity of slurry mixed.

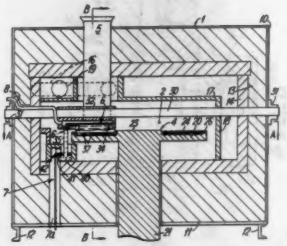
ERRATUM

For Class 261—50 see:
Patent No. 3,563,524

3,563,518
CONTINUOUS HEAT TREATMENT OF MATERIALS

John Victor Alderson, Southport, Robert Smith, Ormskirk, and Geoffrey Wells, Burscough, England, assignors to Pilkington Brothers Limited, Liverpool, England

Filed Apr. 28, 1969, Ser. No. 819,618
Claims priority, application Great Britain, May 2, 1968, 20951/68
Int. Cl. F27b 14/00
U.S. Cl. 263—12 14 Claims

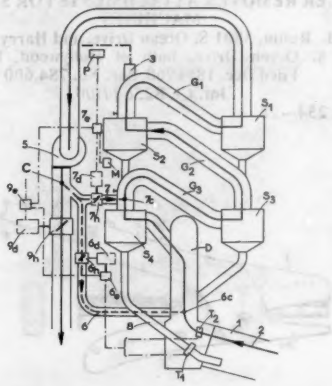


A continuous stream of molten glass or glass fibers is produced by continuously and evenly distributing glass-forming materials onto a hearth, exposing the materials to high temperature to convert the materials into molten glass, and continuously and progressively removing the molten glass upwardly from the hearth by means of suction at the same rate at which materials are distributed onto the hearth.

3,563,519
INSTALLATIONS FOR PREHEATING PULVERULENT SUBSTANCES BY THE WASTE GASES OF A FURNACE FOR TREATING THE SUBSTANCES

Jean-Pierre Lippmann, Vaucresson, France, assignor to Societe Des Forges Et Ateliers Du Creusot, Paris, France

Filed Mar. 11, 1969, Ser. No. 806,181
Claims priority, application France, Mar. 29, 1968, 146,361
Int. Cl. F27b 15/00
U.S. Cl. 263—21 1 Claim



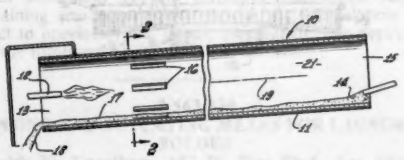
An installation for preheating pulverulent substances by the waste gases of a furnace for treating the substances, in which a fraction of the preheating gases having passed through the preheaters of the installation feeds of a recycling

circuit at at least two places of reintroduction into the reheating cycle, the fraction being taken from a fan sucking in the gases passing through the installation flow in one branch being controlled in response to temperature and in the other branch in response to flow in the preheating circuit.

3,563,520
SIDE PLATE FOR USE IN SINTER GRATES
Fritz Muller, 3 Am grunen Weg, Knapsack near Cologne; Winfried Schmidt, 8 Am Sonnenhang, Kendenich near Cologne, and Hugo Werner, 11 Brunhildstrasse, Hermulheim near Cologne, Germany
Filed Sept. 5, 1969, Ser. No. 855,698
Claims priority, application Germany, Sept. 11, 1968, 1,758,985
Int. Cl. F27b 9/00
U.S. Cl. 263—28 6 Claims

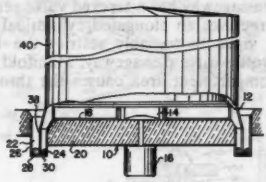
A sideplate for use in grates for the drying, calcining and sintering of ores, minerals or similar materials, e.g. crude phosphate pellets. The sideplate is comprised of individual sideplate elements arranged to be substantially half overlapped by the side plate elements disposed nearest thereto on the two sides of it, and the overlapping contact between the individual sideplate elements is produced by positioning the head portion of each sideplate element so as to be parallel, at an interval corresponding approximately to wall thickness, with the tail end portions thereof. The base portion of each sideplate element has two bolt-receiving oblong holes disposed therein so as to coincide with each of the holes in the sideplate elements nearest to said element on the two sides of it. The ratio of the sideplate height to the hole spacing therein is selected to correspond to a value higher than 0.86, and the frontal surface area of each sideplate element has a substantially circular base portion and a substantially linear head portion, tangential with respect to the circle arc.

3,563,521
MATERIALS LIFTER CONSTRUCTION AND INSTALLATION IN KILNS
George F. Olsen, Colton, Calif., assignor to California Portland Cement Company, Los Angeles, Calif.
Filed Feb. 26, 1969, Ser. No. 802,551
Int. Cl. F27b 7/00; F23m 5/00
U.S. Cl. 263—33 11 Claims



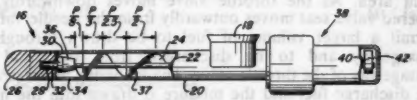
The disclosure concerns apparatus and methods enabling rapid installation of materials lifters in a kiln, with desirably positive connection of the lifters to the kiln shell.

3,563,522
SEALING DEVICE
Calvin C. Blackman, 24272 W. Lake Road, Bay Village, Ohio
Continuation-in-part of application Ser. No. 575,577, Aug. 29, 1966, now Patent No. 3,411,763. This application Apr. 29, 1968, Ser. No. 725,043
Int. Cl. F27b 5/00
U.S. Cl. 263—40 15 Claims



A sealing device for a bell-type furnace which includes a quantity of loose, temperature resisting material such as sand encased within flexible temperature resisting material such as asbestos cloth.

3,563,523
LINING APPARATUS
John S. Wendt, Jr., Sewickley, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.
Filed Aug. 26, 1968, Ser. No. 755,138
Int. Cl. C21b 7/12
U.S. Cl. 266—42 10 Claims

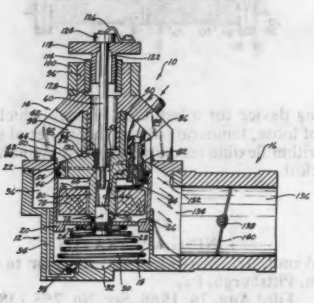


An apparatus for relining metallurgical furnace tap-holes is disclosed. The apparatus is adapted to be inserted in a furnace tap-hole and includes a tubular housing, a supply hopper communicating with the housing for introducing a lining material into the housing and a screw conveyor for advancing the lining material from the hopper forwardly through the housing. The forward end of the housing is closed by a nose piece and the housing has openings around its periphery to the rear of the nose piece. A discharge member is provided within the housing between the forward end of the screw conveyor and the nose piece and generally in the transverse plane of the openings for forcing material radially through the openings. Means are provided for driving the screw conveyor and simultaneously imparting a vibratory motion to the housing so that as lining material is discharged through the openings, the housing's outer wall compacts the lining material against the inner wall of the tap-hole.

3,563,524
CARBURETOR FOR INTERNAL COMBUSTION ENGINES
Edgar D. Jelken, R.R. 1, Jeffers, Minn. 56145
Filed May 28, 1969, Ser. No. 828,521
Int. Cl. F02m 3/00, 7/22
U.S. Cl. 261—50 10 Claims

A carburetor for internal combustion engines comprising a housing having a compartment area therein adapted to be in communication with the intake manifold of the engine. The housing also is provided with a cylindrical bore area formed therein below the compartment area. A throttle valve means is slidably mounted in the housing and is adapted to variably restrict the entrance to the compartment area. A carburetor bowl adapted to contain the fuel therein is secured to the throttle valve means and is slidably mounted in the bore of the housing. A spring means is mounted in the bore and yieldably urges the throttle valve upwardly to restrict the en-

trance to the compartment area. The throttle valve has a combustible fluid passageway formed therein which movably receives a needle valve extending thereinto. The throttle valve has a fluid exit passageway means having one end connected to the passageway of the throttle valve and its other end communicating with the inside of the compartment area. A first conduit communicates with the inside of the fuel bowl and a source of fuel while a second conduit communicates with the compartment area and the inside of the bore. The throttle valve passageway has a tapered valve seat positioned therein which receives an elongated cylindrical end portion of the needle valve to variably restrict the flow of fuel through the throttle valve passageway. Manifold pressure applied to the compartment area causes the throttle valve to



move downwardly against the spring means to increase the amount of air entering the entrance area into the compartment area. As the throttle valve moves downwardly, the tapered valve seat moves outwardly from the needle valve to permit a larger volume of fuel to be drawn through the passageway and to be discharged from the fuel exit passageway of the throttle valve. The incoming air mixes with the discharge fuel and the mixture is drawn into the intake manifold. Means is also provided to achieve "fine" adjustment of the carburetor. A modified version of the carburetor is also disclosed and the primary difference of the same with respect to the first embodiment is the location of the fuel bowl with respect to the umbrella portion of the throttle valve.

3,563,525
FENDER

Jiro Narabu, Tokyo, Japan, assignor to Seibu Gomu Kagaku Kabushiki Kaisha, Tokyo, Japan

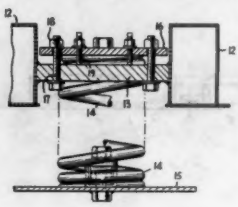
Filed Nov. 19, 1968, Ser. No. 777,059
Claims priority, application Japan, Aug. 10, 1968, Sho 43/56,523
Int. Cl. F16f 1/40
U.S. Cl. 267—140 **7 Claims**

The present invention relates to a fender which consists of a pair of supports and a buffer and is applicable to a quay-wall or a dock, said fender comprising at least a pair of similar supports with elasticity, said pair of similar supports being either connected at the middle parts thereof or formed by two elastic members, each being composed of a flat top and a pair of supports, said two elastic members being combined at the flat tops, and opposite supports in series on both sides being connected to be substantially finished into a pair of supports connected at the middle parts.

3,563,526
FLOATING FLOOR AND SPRING RETAINING CLAMP THEREFOR

Billy Y. K. Mui, Astoria, N.Y., assignor to Korfund Dynamics Corporation, Westbury, N.Y.

Filed July 5, 1968, Ser. No. 742,763
Int. Cl. F16f 1/12
U.S. Cl. 263—178 **8 Claims**



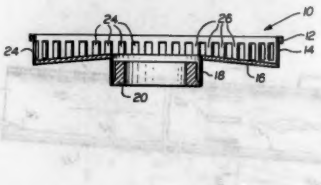
A lightweight floating floor construction for use in a moving vehicle which includes a plurality of parallel supports connected in spaced apart side-by-side fashion by transverse connections and supported above an underneath floor by a plurality of extensible and compressible springs interposed between the underneath floor and spring retaining plates recessed between the supports and mounted on the transverse connections.

A spring retaining clamp for mounting the ends of a spring to a spring retaining surface and including a center hub, oppositely disposed arms extending outwardly from the center hub and having convexly curved ends, and helically extending protuberances at different heights extending across the opposite ends of the arms.

3,563,527
SPRING ASSEMBLY

Alfred Tillman, Mt. Tabor, N.J., assignor to Marotta Valve Corporation, Boonton, N.J.

Filed Mar. 20, 1969, Ser. No. 808,790
Int. Cl. F16f 1/34
U.S. Cl. 267—181 **11 Claims**



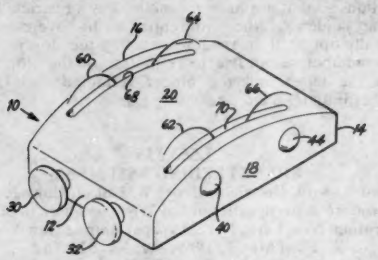
A spring assembly having an annular disc of spring material connected at its inner and outer edges to cylindrical elements that connect the disc between the parts with which the spring is to function. The cylindrical elements are constructed with cutouts that divide the elements into secondary spring elements which are angularly spaced around the edges of the disc and which bend to give the assembly a low hysteresis.

3,563,528

MECHANICAL WIG HOLDER

Joseph Campo, 151 Baldwin St., Bloomfield, and Harold E. Murray, 94 Orchard St., Garfield, N.J.

Filed Sept. 16, 1968, Ser. No. 762,238
Int. Cl. A45d 44/04, 44/14
U.S. Cl. 269—289 2 Claims



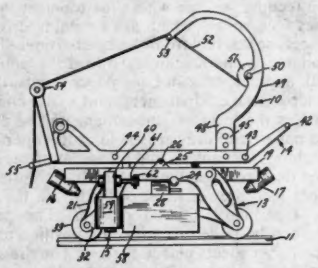
A mechanical wig holder comprising a housing carried in a head form and having catch means pivotably mounted therein, and control means for controlling the movement of the catch means between an operative and an inoperative position.

3,563,529

EDGE CONTROL FOR TURNTABLE CLOTH LAYING MACHINES

Berthold Gottschalk, Brooklyn, and Thomas G. Monaghan, Kew Gardens, N.Y., assignors to Cutting Room Appliances Corp., New York, N.Y.

Filed Mar. 20, 1969, Ser. No. 808,938
Int. Cl. B65h 29/46, 25/26
U.S. Cl. 270—31 3 Claims



A turntable cloth laying carriage including a laterally shiftable component supporting a cloth web supply source. A pair of longitudinally aligned sensing means are selectively actuated depending upon the relative rotational position of the turntable with respect to a rectilinearly moving base to control movement of said shiftable component, thereby maintaining one edge of the web in aligned relation with respect to previously laid goods, the aligned edge depending upon the rotational position of the platform.

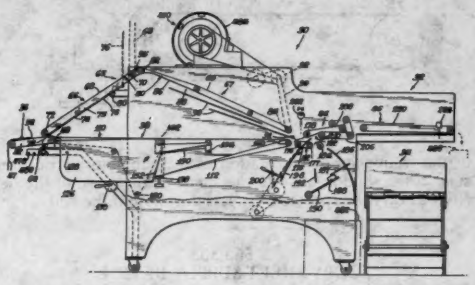
3,563,530

SENSING AND ACTUATING MEANS FOR LAUNDRY FOLDER

Frederick W. Grantham, 152 W. Pico Blvd., Los Angeles, Calif. 90015

Continuation-in-part of application Ser. No. 545,823, Apr. 25, 1966, now Patent No. 3,462,138, dated Aug. 19, 1969.
This application July 24, 1969, Ser. No. 844,505
Int. Cl. B65h 45/18
U.S. Cl. 270—66 6 Claims

A laundry folder for small pieces in which the pieces are folded at an intermediate point such as the middle, including a pair of sensors spaced along the line of travel of the laundry pieces, each laundry piece engaging the first one of the sensors which starts a slow speed advancement of an actuating element away from a control element, and then engaging the second one of the sensors which starts a fast speed return or retracting movement of the actuating element toward the control element, the latter controlling a folding member for folding the laundry piece at a corresponding position between the ends thereof.

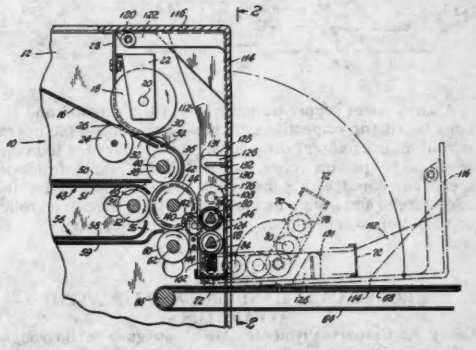


3,563,531

PERFORATING, SCORING OR SLITTING DEVICE FOR FOLDING MACHINE

Thomas J. Gavaghan, Norwalk, and Anthony Luvara, Stamford, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 23, 1968, Ser. No. 707,627
Int. Cl. B65h 45/14
U.S. Cl. 270—68 10 Claims



A device for perforating, scoring or slitting folded sheets of paper as they emerge from a folding machine. The device is permanently mounted in the folding machine and is pivotably connected to a movable panel forming part of a housing for the folding machine so that it can be readily shifted between an operative position and an inoperative position when the housing panel is open and maintained in either position when the housing panel is closed.

3,563,532

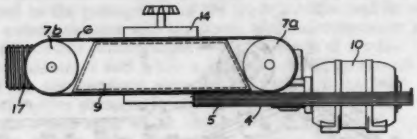
AUTOMATIC DOCUMENT PROCESSING APPARATUS

Leslie John Street, Cotham Park, Bristol, England, assignor to Parnall & Sons Limited, Birmingham, England, a British Company

Filed July 22, 1968, Ser. No. 746,345
Claims priority, application Great Britain, Aug. 18, 1967, 38,175
Int. Cl. B65h 3/12
U.S. Cl. 271—26 3 Claims

A ported belt type single sheet feeder having a variable speed drive transmission between means for driving the belt

and a rotary valve controlling application of subatmospheric pressure to a shoe behind the ported belt to permit variation

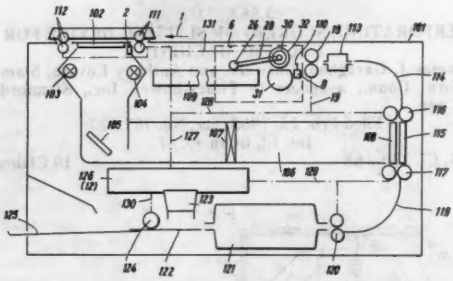


of the frequency of application of the subatmospheric pressure in the shoe relative to the speed of the drive of the belt so as to vary the spacing of sheets drawn onto the belt.

3,563,533
COPY SHEET SUPPLY DEVICE

Walter Limberger, Hamburg-Poppenbuttel, Germany, assignor to Lumoprint Zindler K.H., Hamburg, Germany

Filed Apr. 23, 1969, Ser. No. 818,700
Claims priority, application Germany, Apr. 27, 1968, P1761287
Int. Cl. B65h *3/06, 7/00*
U.S. Cl. 271—36 **9 Claims**

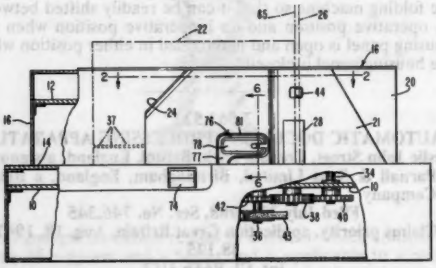


A copy sheet supply device wherein the original and the copy sheets trip respective switches which control the operation of an intermittent drive for a pickup roller for the copy sheets. The pickup roller has a different sheet transport speed compared with subsequent conveyor means for the copy sheets, and a slipping clutch controls a sheet feed roller combination in dependence on this speed differential.

3,563,534
RECORD CARD HANDLING AND LOCATING APPARATUS

Georg K. Caspari, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 27, 1968, Ser. No. 740,623
Int. Cl. B65h *7/08, 9/06*
U.S. Cl. 271—53 **5 Claims**

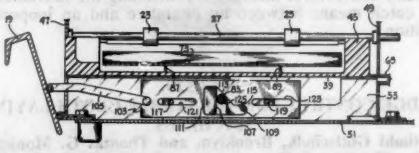


The disclosure embodies a guideway into which a record card is manually inserted and moved therealong until the leading edge of the card is stopped by a retractable stop member which locates the card at a reference point to a card punching station. A portion of the guideway, anterior to the punching station, is restricted by a holder which frictionally holds the card in its precisely located position and is displaceable laterally to move the card against a feed means or pin wheel which thereafter incrementally feeds the card past the punch. The holder is differentially biased in opposite directions so that normally it functions as a restricted portion of the guideway, the differential being overcome by a manually operated means for retracting the stop member. A latch member responsive to retraction of the stop member holds the latter and the holder retracted and the latch member initiates a latch releasing cam.

3,563,535
SHEET FEEDING ASSEMBLY

Gerard A. Vitu, Deerfield, Henry R. Kuksa, Chicago, Ill, and Theodore B Bernett, Kenosha, Wis., assignors to SCM Corporation, New York, N.Y., a corporation of New York

Filed May 5, 1969, Ser. No. 821,762
Int. Cl. B65h *1/12*
U.S. Cl. 271—62 **15 Claims**



In a photocopying machine for copying original objects, for example books, a stack of copy paper sheets is contained in a paper feed drawer located at an operating position inside a compartment which is covered by a door. The forward end of the stack is lifted upwardly by an upwardly biased lifting member to a feeding position where the topmost sheet of the stack engages feed rollers which are rotatably driven to advance the sheets separately from the compartment for further use in the photocopying machine. To load the photocopying machine with another stack of copy paper sheets, the door is moved to uncover the compartment, and a cam connected to the door lowers the lifting member beneath the paper feed drawer. The paper feed drawer is held at the operating position by a latching mechanism, and an actuating member connected to the door releases the latching mechanism and enables the paper feed drawer to be pushed from the operating position by a resiliently biased plunger. The paper feed drawer may then be pulled to a loading position and a fresh stack of copy paper sheets placed therein. The drawer is then pushed to the operating position inside the compartment, thereby pressing the resiliently biased plunger backwardly until the latching mechanism again holds the drawer at the operating position. The door is then moved to cover the compartment, and in so doing moves the cam backwardly to enable the lifting member to move upwardly through the paper feed drawer and lift the forward end of the stack to the feeding position where the topmost sheet engages the paper feed rollers.

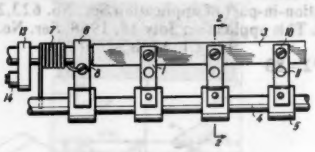
3,563,536
DEVICE FOR GRIPPING PAPER SHEETS

Rudolf Hanzlik, Adamov, and Vladimir Drlik, Bilovice, Czechoslovakia, assignors to Adamovske strojirny narodni podnik, Adamov, Czechoslovakia

Filed Apr. 21, 1969, Ser. No. 817,716
Int. Cl. B65h *29/02*
U.S. Cl. 271—79 **9 Claims**

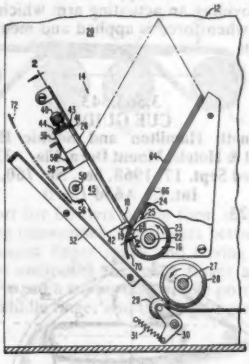
A device to be used in printing presses and the like for gripping paper sheets during transportation thereof includes a pair of parallel shafts one of which is a carrier shaft and the other of which is a stop shaft. The stop shaft carries a plurality of rubber stops which are distributed therealong while the carrier shaft carries a plurality of springy grippers which are fixed thereto and extend therefrom into overlapping relation

with respect to the several stops. The grippers are all made of springy flat leaf spring material. At their ends where they overlap the stops the grippers respectively carry rubber



plates situated between the leaf springs and stops and directly engaging the latter when there is no sheet gripped between these rubber plates and rubber stops.

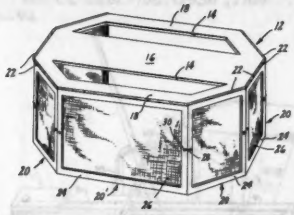
3,563,537
SHEET STACK FEED DEVICE WITH SHIFTABLE THROAT RESTRICTOR
Paul John Thut, Penfield, N.Y., assignor to Burrough Corporation, Detroit, Mich.
Filed Oct. 14, 1968, Ser. No. 767,310
Int. Cl. B65h *1/06*
U.S. Cl. 271—41 **2 Claims**



The disclosure embodies a V-shaped sheet stack hopper having a downwardly directed opening at its apex. At the apex of the hopper, and in part forming one of the walls thereof, is a shiftable or positionable restricting member which forms a card restricting outlet with a resilient tire of a card feed roller. Mounted on the hopper and supporting the positionable restricting member is a body on which there is an adjustment member operable to establish a set restriction with the tire, corresponding to a given card thickness. Also mounted on the body is a shifter member by means of which the positionable member may be readily shifted to change the restriction to one for accommodating cards of other thickness.

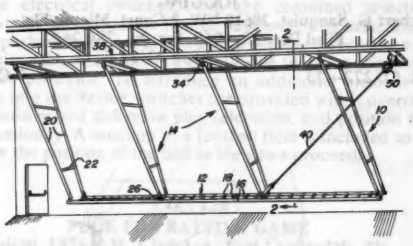
3,563,538
PUPPET STAGE
Mary A. Harper, Mansfield, Conn. (Rte. 1, Box 183D Stoors, Conn. 06268)
Filed July 8, 1968, Ser. No. 743,206
Int. Cl. A63j *19/00*
U.S. Cl. 272—1 **6 Claims**

A puppet stage comprises a platform having a relatively large aperture therethrough and a multiplicity of support members hingedly joined to the platform at spaced locations on the periphery thereof. The support members are movable between a position parallel to the plane of the platform to a position generally perpendicular thereto, and they are



securable in the perpendicular position to support the platform above them.

3,563,539
VERTICALLY ADJUSTABLE EXERCISING APPARATUS
Clarence R. Rogers, 1857 Carl St., Walla Walla, Wash. 99362; Tom Lamb, Rte. 1, Waitsburg, Wash. 99361; Marvin Dahl, 518 Balm St., Walla Walla, Wash. 99362; and Harvey Morrison, 148 Hobson St., Walla Walla, Wash. 99362
Filed Mar. 14, 1968, Ser. No. 713,117
Int. Cl. A63b *17/02*
U.S. Cl. 272—63 **7 Claims**



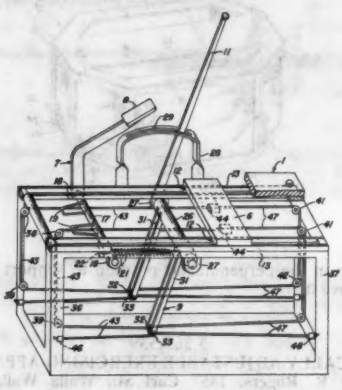
A horizontally orientated exercising ladder suspended from an overhead support by a plurality of rigid pivotally connected suspension members which enable a vertical swinging of the ladder between a raised storage position and any one of a plurality of different height exercising positions. The adjustment of the apparatus is effected through a winch controlled cable. Further, auxiliary equipment can be mounted on the adjustable ladder for adjustment therewith.

3,563,540
FULCRUM SHIFTING DEVICE FOR DIVING BOARDS
Henry Hopfeld, Valley Head, Ala.
Filed Jan. 24, 1969, Ser. No. 793,871
Int. Cl. A63b *5/10*
U.S. Cl. 272—66 **10 Claims**

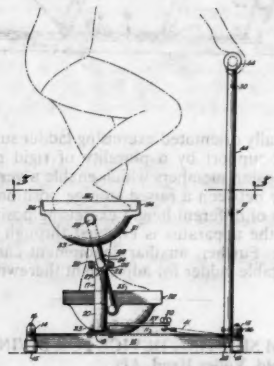
A fulcrum is formed near the secured end of the diving board by a transverse fulcrum member on which the diving board rests and about which the springing of the diving board is fulcrumed. The fulcrum member is supported at its ends slideably longitudinally with respect the diving board to change the location of the fulcrum thereby to change the stiffness or springing action of the diving board. The fulcrum is shifted by means of one or more lines secured to the fulcrum member and played over fixed guides and over movable guides and fixedly anchored at their free ends.

A diving board lifting device raises the diving board to free the fulcrum member from the weight of the board while the fulcrum member is pulled into selected position. The

manipulating handle for pulling said lines for shifting the fulcrum member and a pedal for operating the diving board lifting device are in such relation as to permit a person to operate them simultaneously.

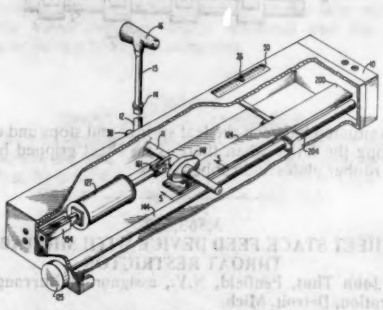


3,563,541
FOOT PEDAL EXERCISE MACHINE FOR SIMULATING JOGGING
Herbert G. Sanquist, 20610 NW. 2 Court, Miami, Fla. 33169
Filed Dec. 23, 1968, Ser. No. 786,266
Int. Cl. A63b *23/04*
U.S. Cl. 272—73 7 Claims



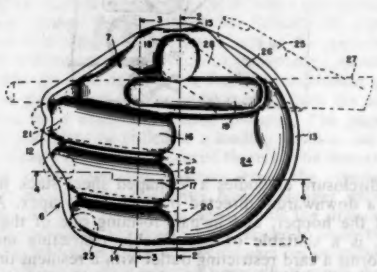
A stationary exercise machine for simulating standup jogging or running-type exercise wherein a pedal-type mechanism is swivelly supported on a vertical axis and has pedal platforms heavily weighted to impart an oscillatory twisting or side-to-side movement to the crank mechanism upon operation. Adjustable return-to-center spring means controls the amplitude and uniformity of the twisting motion to suit the requirements of the operator. Center of gravity of pedal weight is located well below the pedal platform axis so that the pedal platforms will seek horizontal or level rest positions.

3,563,542
ARM EXERCISER
James M. Wellman, Lakeland, Fla. (c/o Wellman-Lord, Inc., New Mulberry Hwy., P.O. Box 2436 Lakeland, Fla. 33803), and James I. Baer, Lakeland, Fla.; said Baer assignor to said Wellman
Continuation-in-part of application Ser. No. 623,258, Mar. 15, 1967. This application July 18, 1968, Ser. No. 745,909
Int. Cl. A63b *21/00*
U.S. Cl. 272—83 17 Claims



Apparatus for imparting tension in a smooth manner having tension imparting means adapted to impart smooth tension through the action of a tension transmission means and the incorporation of this apparatus in an arm exercising mechanism providing an actuating arm which can be placed under tension when force is applied and means to avoid flyback of the arm.

3,563,543
CUE GUIDE
Matthew Kenneth Hamilton and Sophie Hamilton, Sylan Shores Motel & Hotels, Mount Dora, Fla. 32757
Filed Sept. 17, 1968, Ser. No. 760,317
Int. Cl. A63d *15/10*
U.S. Cl. 273—23 4 Claims

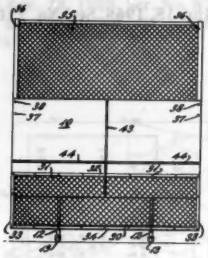


A cue guide and hand rest for use in playing pool and billiards which is positioned on a pool or billiard table for supporting the hand of the player, which normally guides the cue, in a correct position with the hand properly cupped and with the third, fourth and fifth fingers properly spread in the position of the hand as normally assumed by an experienced player.

3,563,544
PORTABLE TENNIS INSTRUCTION AND PRACTICE BOARD
Andrew J. Hedrick, 1319 Azalea Drive, Jacksonville, Fla.
Filed July 15, 1968, Ser. No. 744,844
Int. Cl. A63b *69/00*
U.S. Cl. 273—29 3 Claims

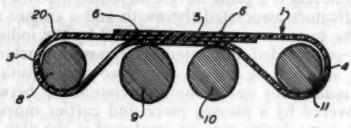
A portable tennis instruction and practice apparatus having a large vertically disposed rectangular board with verti-

cally disposed rectangularly shaped nets located along the upper and lower edges thereof, and extending above and



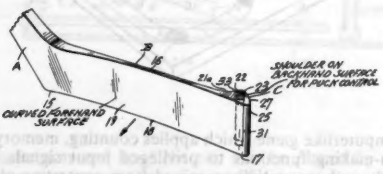
below the respective edges thereof. The board is held in an upright position by pivotally attached column support members.

3,563,545
FINGER SUPPORT FOR BOWLERS
Albert E. Rasche, 23 Morris Road, West Orange, N.J.
Filed Feb. 10, 1966, Ser. No. 526,612
Int. Cl. A63b *71/14*
U.S. Cl. 273—54 **6 Claims**



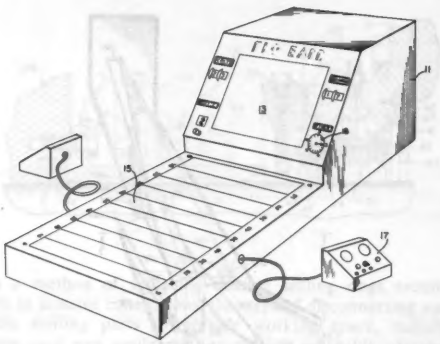
A finger support for bowlers in the form of an elongated member extending transversely the fingers between the palm and the first adjacent finger joints and having two flexible end loop portions encircling the index finger and the litter finger respectively, and a supporting middle portion engaging the backs of the middle finger and the ring finger.

3,563,546
HOCKEY STICK WITH SHOULDER ON BACKHAND SURFACE FOR PUCK CONTROL
Frank Earle Dawe, 18 Hillcrest Ave., St. Catharines, Ontario, Canada
Filed Sept. 30, 1968, Ser. No. 763,766
Int. Cl. A63b *59/12*
U.S. Cl. 273—67 **8 Claims**



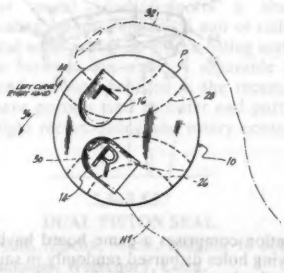
The blade of the hockey stick is provided on its backhand surface adjacent the toe with a shoulder extending in the backhand direction and having a surface forming a continuation of the backhand surface providing a puck-cradling bay adapted to deter the puck from sliding off the end of the stick, which is specially useful when the blade is curved in the forehand direction to improve the forehand shot.

3,563,547
FOOTBALL GAME WITH PLAY PROJECTION
Lawrence B. Marsh, Baltimore, Md. ((12825 Littleton St., Sliver Springs, Md., 20906))
Filed Mar. 5, 1968, Ser. No. 710,475
Int. Cl. A63f *7/06*; G03b *21/04*
U.S. Cl. 273—94 **7 Claims**



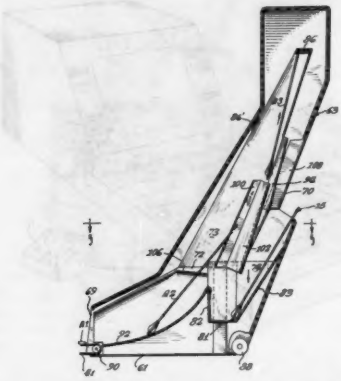
An electromechanical simulation of a football game including a plurality of films showing different actual football plays and a projection system for showing the film. Provision is made for selection of offensive and defensive plays respectively from a plurality of choices. The particular selections operate electrical switches, with the combined selection determining the particular film to be shown. The selection is accomplished through a motor driven gearing associated with a circular rack which holds a plurality of films for alignment with the projector. To introduce an additional element of chance into the device, switches are provided which override the offensive and defensive play selections, and position the rack randomly. A mockup of a football field is included so as to show the position of the ball as the game proceeds.

3,563,548
PUCK FOR BATTING GAME
Carl Tolotti, 1871 N.W. 63rd Ave., Fort Lauderdale, Fla.
Filed May 12, 1969, Ser. No. 823,713
Int. Cl. A63b *65/00*
U.S. Cl. 273—95 **4 Claims**



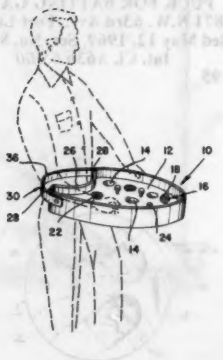
A game played by two competitive teams employs a flat circular puck which is pitched to a batter who attempts to strike the puck with a flat bat. The batters run between bases on opposite sides of a playing field until the puck is returned to a base on either side of the field. The puck is formed with recesses on one side and arcuate grooves on the other side to facilitate grasping the puck for pitching it.

3,563,549
ARROW STORAGE QUIVER AND CONVEYOR BELT FOR TRANSPORTING ARROWS TO THE QUIVER
John J. Dragone, North Muskegon, and Thomas W. O'Connor, Ravenna, Mich., assignors to Brunswick Corporation
Filed Feb. 14, 1969, Ser. No. 799,443
Int. Cl. F41b 5/06
U.S. Cl. 273—103 14 Claims



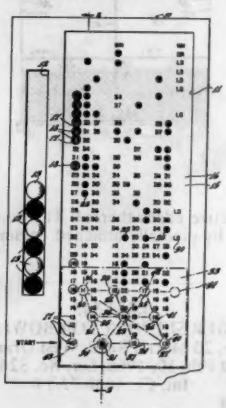
An arrow storage quiver adjacent the firing line of an archery range which receives arrows from a conveyor belt running from the target to the firing line. The storage quiver stores arrows in an upright position which is readily accessible to an archer.

3,563,550
BODY MANIPULATED GAME
Harvey Ronald Saunders, 412 Sinclair St., Norfolk, Va. 23505
Filed Apr. 22, 1968, Ser. No. 723,031
Int. Cl. A63b 67/14
U.S. Cl. 273—113 5 Claims



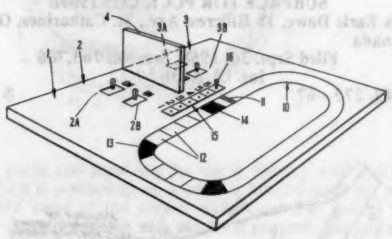
The invention comprises a game board having a plurality of disqualifying holes disbursed randomly in said board. Also disposed on the board is a multiplicity of scoring area into which an object may be moved by manipulating the board. A portion of the periphery of the board is curved and a strap is connected to the board so that the board may be releasably held to the body of the player. The board being manipulated by the gyrations of the person to whom the board is releasably fastened so that a score may be added by moving at least one ball in and out of the scoring areas attempting to avoid the disqualifying holes in the board. A plurality of obstacles may be randomly disbursed on said board.

3,563,551
PREPROGRAMMED SOLITAIRE BOARD GAME APPARATUS
Joseph A. Weisbecker, 1220 Wayne Ave., Erlton, Cherry Hill, N.J. 08034
Filed Apr. 15, 1968, Ser. No. 721,353
Int. Cl. A63f 3/00
U.S. Cl. 273—130 7 Claims



Disclosed herein is a game device including a board having position indicators associated therewith and a carrier movable along the board to positions indicated by the indicators. The carrier is provided with windows exposing markings on the board, and playing pieces are removably positionable over the windows for determining a relationship between a marking covered by a playing piece and carrier movement. The instant game device may be employed in the play of tic-tac-toe, an individual playing against the preprogrammed game.

3,563,552
LOGIC GAME
David Korff, 19 Carriage Drive, Lexington, Mass. 02173; and Adolph Baker, 7 Gage Road, Wayland, Mass. 01778
Filed Nov. 26, 1968, Ser. No. 779,130
Int. Cl. A63f 9/00
U.S. Cl. 273—135 5 Claims



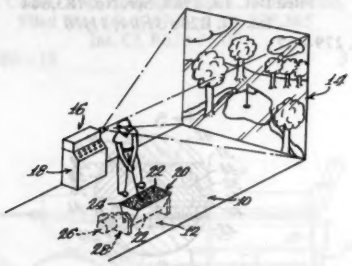
A computerlike game which applies counting, memory and decision-making functions to privileged input signals independently and sequentially received from contesting players in emitting or not emitting an output signal. In its simplest form two pairs of "on-off" electrical switches are provided, with each pair secretly controlled by a contestant to generate "on" or "off" input signals. Circuit means count the total "on" signals received and store them in a memory means. A decision-making means generates an output signal when two "on" signals are received in the memory means. The output signal is used to indicate a winner of game or particular round.

3,563,553

AUTOMATIC INDEXING OF INDEXIBLE TEE FOR AUTOMATIC LIE SELECTION

Bradford J. Baldwin; Robert M. Conklin, and Jack A. Russell, Muskegon, Mich., assignors to Brunswick Corporation

Filed Apr. 29, 1969, Ser. No. 820,102
Int. Cl. A63b 67/02, 69/36
U.S. Cl. 273—176 18 Claims



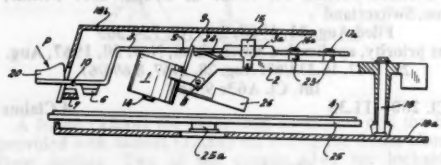
An automatic lie selection control for indexible tee constructions which are adapted to dispose any one of a plurality of different lie simulating mats at a predetermined location in a tee area of an indoor golf game. In one embodiment, lie material information is derived from scene selection switches of a projector that projects scenes of different portions of holes on a golf course to a screen for display purposes for a golfer playing the game. In another embodiment, lie selection information is derived from a coding associated with each frame on a film illustrating various scenes from a golf course so that projection of a selected scene results in the disposition of a corresponding lie material at a predetermined location at the tee area.

3,563,554

APPARATUS FOR SETTING A TONE ARM AND HEAD ON SELECTED PORTIONS OF A RECORD CARRIER

Peter Hess, Mammolshain; Wolfgang Fronek; Heinz Gierjets, and Jorg Rodenbeck, Wilhelmshaven, Germany, assignors to Olympia Werke Akteingesellschaft, Wilhelmshaven, Germany

Filed June 13, 1969, Ser. No. 833,014
Claims priority, application Germany, June 15, 1968, Apr. 26, 1969, P1,772,666;P1,921,350
Int. Cl. G11b 17/06
U.S. Cl. 274—13 19 Claims



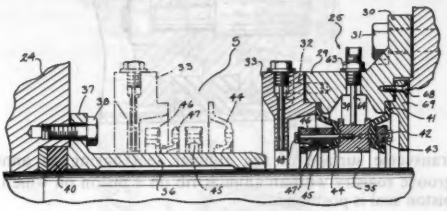
A tone arm and head thereon can be placed by manual setting means on selected portions of the record carrier. The setting means has a normal inoperative position and a setting position, and first control means place the head in a retracted position when the setting means is moved to the setting position. Second control means prevent the setting means in the inoperative position from moving the tone arm while the head engages the record carrier. The control means prevent together any accidental movement of the head in the active position across the record carrier.

3,563,555

METHOD OF REPLACING SEALING RINGS AROUND SHAFTS

Harold O. Koons, New Berlin, Wis., assignor to Waukesha Bearings Corporation, Waukesha, Wis., a corporation of Wisconsin

Filed Mar. 29, 1968, Ser. No. 717,297
Int. Cl. F16j 9/00; E21b 33/00
U.S. Cl. 277—1 9 Claims



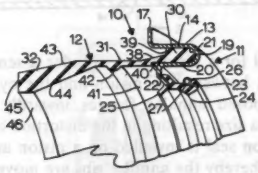
In a method of replacing flexible sealing rings around shafts in massive installations, the steps of disconnecting and axially shifting parts to provide working space, radially cutting each new sealing ring to provide separable adjacent ends which may be flexed and spread to install the sealing rings around the shaft by transverse movement into installed position, adhesively bonding the cut ends together while around the shaft, cutting off the worn sealing rings, and reassembling the parts.

3,563,556

BOOT-TYPE SHAFT SEAL UNIT

Arthur M. Scott, Twin Falls, Idaho, assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed July 30, 1969, Ser. No. 846,204
Int. Cl. F16j 15/38
U.S. Cl. 277—65 9 Claims



An annular metal case supports a shaft-engaging elastomeric sealing member and has a pair of radially spaced apart cylindrical walls providing a bore-fitting surface and an annular recess between the walls. A separable elastomeric boot has an end portion anchored in the recess, an axially collapsible sleeve portion, and an outer end portion providing a ring in light reciprocating and rotary contact with the shaft.

3,563,557

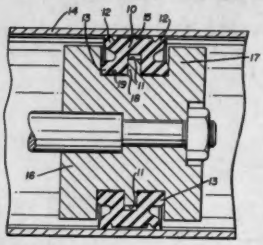
DUAL PISTON SEAL

Kingsley A. Doutt, Alpena, Mich., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Nov. 4, 1968, Ser. No. 772,975
Int. Cl. F16j 9/04, 15/32
U.S. Cl. 277—178 1 Claim

A piston seal for a piston and cylinder assembly and comprising an annular sealing member or ring having oppositely disposed sidewardly extending flanges for sealing engagement with said cylinder and an intermediate transversely flat annular bearing surface. The piston seal having secondary op-

positely disposed flanges adjacent its point of contact with the piston and the outer annular edges of said flanges being rounded in a modified O-ring configuration. The innermost



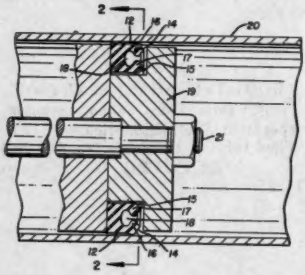
transverse surface of the annular seal having an annular groove registry with an annular rib on a piston on which the piston seal is positioned.

3,563,558

PISTON SEAL WITH DISTORTABLE RIBS

Kingsley A. Doutt, Alpena, Mich., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Nov. 4, 1968, Ser. No. 772,976
Int. Cl. F15j *15/32*
U.S. Cl. 277—205 **4 Claims**



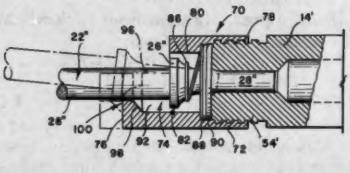
A piston seal for a piston and cylinder assembly to effect sealing contact between the piston and the cylinder having oppositely disposed annular flanges inwardly of one side thereof and of a size resulting in the distortion of said flanges when said piston seal is installed on a piston and positioned in a cylinder whereby the annular ribs are moved into an undulating shape adding increased resiliency and shape retaining characteristics to the piston seal.

3,563,559

SAFETY LOCKING TOOL HOLDER FOR PNEUMATIC HAMMER

James O. Taylor, Lantana, Fla., assignor to Florida Pneumatic Manufacturing Corporation, Lantana, Fla.

Continuation-in-part of application Ser. No. 710,235, Mar. 4, 1968. This application July 15, 1968, Ser. No. 745,050
Int. Cl. B23b *31/06*
U.S. Cl. 279—19 **6 Claims**



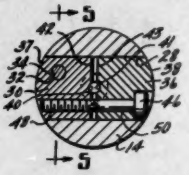
A safety locking holder for mounting an attachment tool onto a pneumatic hammer prevents tool removal when the holder is fully screwed onto the hammer. The holder includes a slotted end portion and an open chamber portion which permit ready insertion and removal of an attachment tool when the holder is in nonlocking engagement with the hammer.

3,563,560

CHUCK ASSEMBLY

Robert C. Johnson, 9 Flower Court, Lakeside Park, Ky.

Filed Dec. 13, 1968, Ser. No. 783,644
Int. Cl. B23b *31/04, 31/10*
U.S. Cl. 279—67 **8 Claims**



A chuck assembly and deep hole tool therewith, the chuck comprising a head, a shank and a centrally aligned bore for supporting the tool. A pair of complementary plugs are mounted in the head of the chuck in a bore diametrically extending therethrough. A dowel pin is disposed in the head offset to its axis, and attaches the first plug thereto. An allen screw, exposed to the peripheral exterior of the chuck assembly, extends through the second plug into the first plug, generally at right angles to the line of the dowel pin, whereby the second plug is drawn towards the first plug upon tightening said screw and thereby securely seats both plugs to within the head of the chuck. Corresponding grooves in the central faces of the plugs are provided for engaging the shank of the tool tightly held by such chuck assembly.

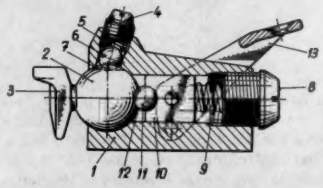
The tool itself comprises a cutting tip brazed to an elongated shank, a second shank integrally formed upon the first and having a greater diameter thereover, and a third shank integrally formed upon the second shank and having a greater diameter therefrom. A pair of O-rings are spacedly mounted in their respectively annular grooves about the periphery of the third shank whereby upon insertion of the third shank in a spindle mounted in a stock of a tooling machine, seepage of collant and lubricating oil about the tool's shank is prevented and all such oil flows within the tube's bore to the cutting tip itself.

3,563,561

SKI BINDING WITH AUTOMATIC RELEASE

Willy Bernard Mottet, 80, Route de Brugg, 2500 Bienne, Berne, Switzerland

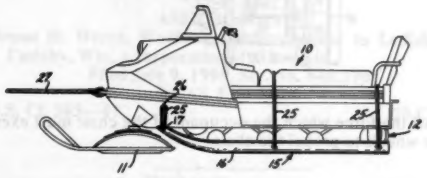
Filed Aug. 21, 1968, Ser. No. 754,303
Claims priority, application Switzerland, Nov. 20, 1967, Aug. 28, 1967, 16,334/67, Aug. 28, 1967, 8,694/67
Int. Cl. A63c *9/084*
U.S. Cl. 280—11.35 **4 Claims**



A ski binding to enable automatic release of the boot on falling, has a front stop element and a heel element each including a ball joint. The ball joint has a cavity into which a suitably shaped piston or piston and roller are urged by a spring, the tension of which is adjustable by a screw. The ball

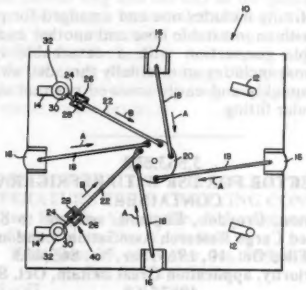
joint may have a second ball and socket detent in the heel element, also adjustable by means of a spring and a screw. The heel element includes a release lever, arranged so that pressure on the lever counteracts the action of the spring urged piston or roller.

3,563,562
DEVICE FOR RENDERING SNOWMOBILES AND THE LIKE TOWABLE
Eunice A. Carlin, 5301 Hollywood Road, Edina, Minn. 55424
Filed May 16, 1969, Ser. No. 825,365
Int. Cl. B62b *15/00*
U.S. Cl. 280—19 **3 Claims**



A sheet of plastic having holes adjacent the edges thereof affixed to the underside of a snowmobile so as to underlie the drive mechanism and form a runner thereunder to render a snowmobile towable.

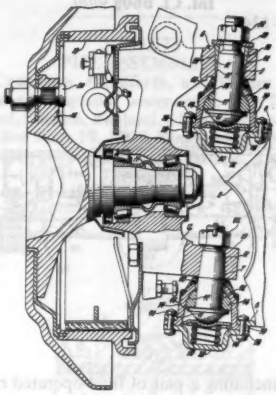
3,563,563
RUNNING FRAME FOR A CONTAINER
Zeljko Radovic, Aarau, Switzerland, assignor to Sybron Corporation, Rochester, N.Y.
Filed Apr. 9, 1969, Ser. No. 814,782
Claims priority, application Germany, July 11, 1968, 1,755,928
Int. Cl. B60b *33/02*
U.S. Cl. 280—79.1 **3 Claims**



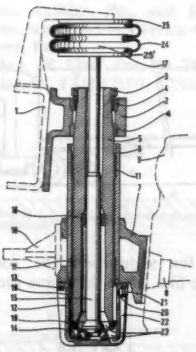
A frame (12,14) for supporting containers and the like is provided with castors (12,14) for rolling the frame along the floor surface. Two of the castors (14) are lockable to facilitate handling of the frame as it is being manually pushed along the floor surface, the castors being unlocked automatically to facilitate the movement of the frame along the floor surface by mechanical means.

3,563,564
VEHICLE WHEEL MOUNTING
Walter A. Bartkowiak, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 21, 1969, Ser. No. 826,511
Int. Cl. B62d *7/18*
U.S. Cl. 280—96.1 **5 Claims**

A wheel-mounting assembly having a kingpin-type steering knuckle connected by a pair of tension-type ball joints to a beam type axle. One of the ball joints is secured to the steering knuckle by vertically adjustable means which permit the tension loading on the ball joints to be set at a desired level.



3,563,565
TELESCOPE SUSPENSION FOR INDEPENDENT WHEELS OF VEHICLES
Roberto Perlini, Viale dell'Industria, San Bonifacio, Verona, Italy
Filed June 18, 1968, Ser. No. 738,013
Claims priority, application Italy, July 3, 1967, 61248/67
Int. Cl. B60g *11/28, 3/00*
U.S. Cl. 280—96.2 **8 Claims**

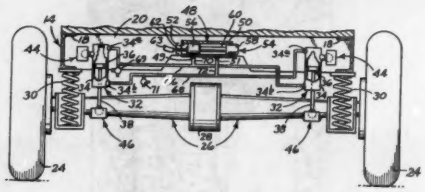


A telescope suspension for individual wheels, preferably of motor vehicles, comprising a telescopically movable unit inserted between a wheel and the frame of the vehicle. A load-carrying resilient supporting element is arranged outside the telescopically movable unit to avoid the use of gaskets and possible leaks resulting therefrom. The telescopically movable unit includes an inner and an outer cylinder movable relative to each other and a hydraulic fluid expansion chamber interposed between said cylinders and communicating through a valve with a reserve fluid chamber to cushion the movements of said cylinders and thereby those of the supported wheel with respect to the frame of the vehicle.

3,563,566
VEHICLE STABILIZING MEANS

Steven L. Weber, Rte. 5, Box 733, Oregon City, Oreg. 97027

Filed Oct. 15, 1968, Ser. No. 767,707
Int. Cl. B60g 9/00
U.S. Cl. 280—124 5 Claims

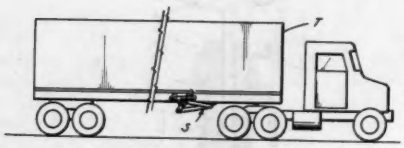


A vehicle including a pair of fluid-operated rams disposed adjacent opposite sides thereof, with each ram interposed, and accommodating relative movement, between the vehicle's frame and an axle beneath the frame. Interconnecting the rams is a conduit system including a valve which is adjustable from within the vehicle's cab to control fluid flow to and from the rams. In one position, the valve produces fluid interchange between the rams whereby a change in the effective length of one causes a related change in the effective length of the other. In another position, the valve frees the rams for independent operation.

3,563,567
LANDING GEAR FOR SEMITRAILERS AND THE LIKE

Charles E. Harp, 2110 Harper St., Pasadena, Calif. 77502

Filed May 27, 1969, Ser. No. 828,306
Int. Cl. B60s 9/04
U.S. Cl. 280—150.5 4 Claims



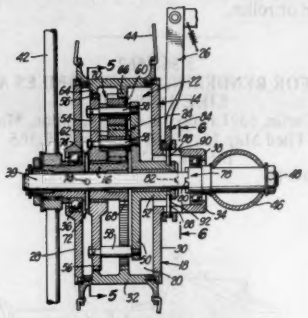
Landing gear for supporting the forward end of a semitrailer and the like, after the prime mover or tractor has been removed.

3,563,568
VARIABLE RATIO ROTARY DRIVE MECHANISM AND WHEEL CHAIR EMBODYING SAME

Reuben V. Sasse, 703 Verde Vista, Pomona, Calif., 91767, and John A. Charvat, 1138 W. "B" St., Ontario, Calif. 94662

Filed Sept. 20, 1968, Ser. No. 761,114
Int. Cl. B62m 1/16, 1/16; F16h 57/10
U.S. Cl. 280—230 2 Claims

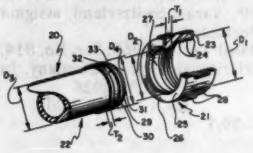
A variable ratio rotary drive mechanism is provided for wheel chairs and other uses. The drive mechanism has a pair of concentric driving and driven members defining an intervening annular space containing a variable ratio gear train which drivably couples the members, whereby rotation of the driving member drives the driven member in rotation. A shift lever is provided for operating the gear train to vary its ratio and thereby the mechanical advantage of the drive mechanism. A wheel chair is provided having wheel assemblies embodying the rotary drive mechanism to permit adjustment of the force which the occupant of the chair must exert on the wheels to propel the chair.



3,563,569
DUAL CONNECTION TUBULAR FITTING

Roy Calvin Wilson, 947 Grant Line Road, Santa Paula, Calif. 93060

Filed Dec. 26, 1968, Ser. No. 787,132
Int. Cl. F16l 19/02, 47/00
U.S. Cl. 285—5 1 Claim

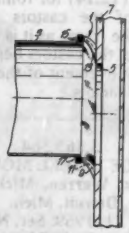


A tubular fitting includes one end arranged for permanent connection with an insertable hose and another end arranged for detachable connection with a detachable hose. The detachable hose includes an internally threaded swivel collar that can be quickly and easily screwed onto an unthreaded from the tubular fitting.

3,563,570
CONNECTOR FOR USE WITH REFRIGERATED CONTAINERS

Rupert Munton, Croydon, England, assignor to Shipowners Refrigerated Cargo Research Association, London, England

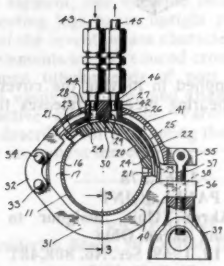
Filed Oct. 10, 1969, Ser. No. 865,433
Claims priority, application Great Britain, Oct. 8, 1968, 49875/68
Int. Cl. F16l 25/00
U.S. Cl. 285—9 6 Claims



A connector nozzle or coupling device for connecting a transportable container to a supply of fluid under pressure

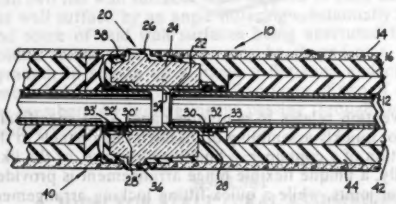
and in particular for connecting refrigerated containers with a refrigeration system, the coupling being formed of at least two layers of bristles having an impermeable membrane sandwiched therebetween, said bristles and membrane being clamped at one end and engageable around a duct leading from the refrigeration system and the free end of the thus formed coupling being arranged to abut around an aperture in the container, the arrangement being such that the bristles will automatically accommodate movement of the container at the coupling station and still maintain a seal with the coupling and will automatically effect the seal with the container when the container is delivered to the coupling station, the coupling automatically defecting a seal and not requiring any form of power operated device to move it between a coupled position and an uncoupled position.

3,563,571
ASEPTIC JOINTS
Bruno H. Werra, Waukesha, Wis., assignor to Ladish Co., Cudahy, Wis., a corporation of Wisconsin
Filed July 9, 1969, Ser. No. 840,198
Int. Cl. F16l *53/00*
U.S. Cl. 385—41 **10 Claims**



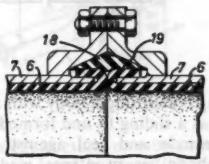
An aseptic joint has a sealing gasket interposed between the flanges of two pipe ends, there being a rubber ring around the gasket to form an annular steam chamber between the rubber ring and the OD of the gasket, and there being means including a steam inlet and outlet nipple with a dam between for continuously circulating steam throughout the length of the steam chamber. A clamping ring acts on the flanges of the two pipe ends to engage the gasket and rubber ring therebetween, the clamping ring having a slot through which the steam nipple projects.

3,563,572
COMPOSITE COUPLING FOR INSULATED HIGH TEMPERATURE FLUID CARRYING CONDUITS
David Walter French, Somerville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.
Filed June 23, 1969, Ser. No. 835,592
Int. Cl. F16l *59/16*
U.S. Cl. 285—47 **19 Claims**



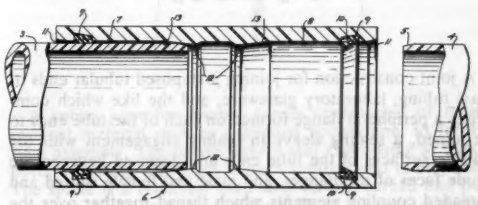
Thermal insulated fluid carrying conduit composed of concentric lengths of pipe spaced apart from each other by intermediate insulating material, having assembled thereon a push-in composite coupling unit providing a male type linkage for cooperating union with a corresponding female type linkage on an adjacent section of such a conduit which upon simple insertion joining, forms a slip joint connection uniting and fluid sealing each of the adjacent concentric pipes with their respective counterparts and which also provides a thermal expansion joint.

3,563,573
PIPE ASSEMBLIES
John L. F. Crompton, Handforth, and Walter C. Peart-Davies, Knutsford, England, assignors to The Dunlop Company Limited, London, England, a British company
Filed Mar. 19, 1969, Ser. No. 808,458
Claims priority, application Great Britain, Apr. 2, 1968, 15704/68
Int. Cl. F16l *9/14*
U.S. Cl. 285—55 **5 Claims**



A pipe assembly comprises two lengths of elastomer-linted pipe, particularly fibreglass-resin pipe, the lining of each length extending around the end to be coupled and folding back in a snug fit over the surface of the length, each length carrying a dished coupling member, the coupling members together providing a channel between them in which lies an annular sealing member, usually of elastomeric material, and pressing the sealing member against the folded-back portions of the lining.

3,563,574
COUPLING FOR PLASTIC PIPE
Joseph C. Jackson, Ambler, Pa., and Joseph C. Giuffre, McPherson, Kans., assignors to Certain-teed Products Corporation, Ardmore, Pa.
Filed Jan. 28, 1969, Ser. No. 794,646
Int. Cl. F16l *27/10, 47/00*
U.S. Cl. 285—187 **5 Claims**



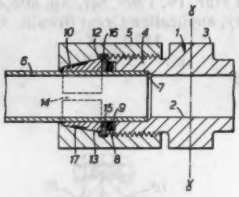
A coupling or joint for use in interconnecting adjacent ends of sections of pipe made of plastic material, comprising a coupling sleeve with sockets to receive the ends of adjacent pipe sections, sealing rings between the pipe ends and the inside of the sockets, and mechanism for limiting assembly movement of the pipe ends into the sockets comprising annular abutments having inclined abutment faces spaced from each other, the inclined abutment faces being configured and proportioned in relation to the ends of the pipes to accommodate thermal expansion of the pipes.

3,563,575

PIPE COUPLINGS

Richard Ayshford Sanford, Broadway, Worcestershire, England, assignor to The Tungum Company Limited, Cheltenham, England

Filed Nov. 4, 1968, Ser. No. 772,920
Claims priority, application Great Britain, Nov. 9, 1967, 50,966
Int. Cl. F16l 21/06
U.S. Cl. 285—323 1 Claim



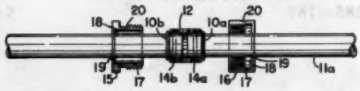
A pipe coupling comprising a body with a bore adapted to receive the pipe as a sliding fit and formed with a recess for an O-ring to encircle and seal against the pipe. A nut threaded on the body has an internal wedge surface, and a longitudinally split pipe-gripping collar encircles and grips the pipe and has an external wedge surface which is complementary to and cooperates with the wedge surface in the nut. The external wedge surface on the collar is relieved intermediate the ends of the collar, by a rectangular-section annular groove so as to decrease the area engaging the nut without decreasing the effective overall length of the wedge surface.

3,563,576

TUBULAR JOINT CONTRUCTION

Thomas E. Lee, 1019 Upper Happy Valley Road, Lafayette, Calif.

Filed Apr. 21, 1969, Ser. No. 817,706
Int. Cl. F16l 17/00
U.S. Cl. 285—353 5 Claims



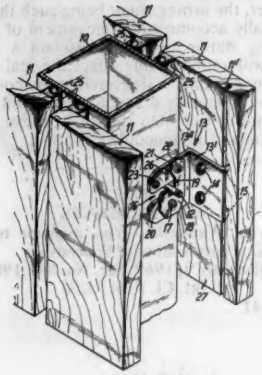
A joint construction for joining juxtaposed tubular ends of glass tubing, laboratory glassware, and the like which comprises a peripheral flange formed on each of the tube ends to be joined, a sealing sleeve in sealing engagement with the outside surfaces of the tube ends and disposed between the inside faces of the flanges, and male and female slotted and threaded coupling elements which thread together over the sleeve and seat upon the exterior faces of the flanges.

3,563,577

WALL PANEL ASSEMBLY

Erich Wittenmayer, Altensteig, Germany, assignor to Christian Holzapfel K.G., Ebhausen, Wurttemburg, Germany

Filed Feb. 7, 1969, Ser. No. 797,500
Claims priority, application Germany, Feb. 22, 1968, H61876
Int. Cl. F16b 7/00
U.S. Cl. 287—20.92 11 Claims



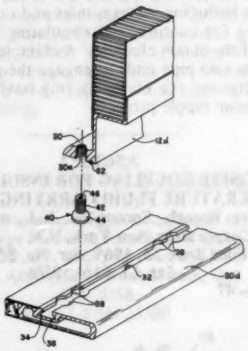
Cover members such as wall panels are releasably attached to a load-bearing member by cooperating male and female connecting means. The connecting means are secured against unintentional disengagement by a mechanical locking device which is actuatable by the connecting means during movement of the cover members relative to the load-bearing member. The force applied in moving the cover members away from the load-bearing member releases the locking device.

3,563,578

PANEL JOINT

Oscar W. Meller, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Mar. 19, 1969, Ser. No. 808,481
Int. Cl. F16b 5/07
U.S. Cl. 287—20.924 6 Claims

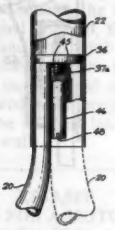


The invention relates to a unique panel joint specifically adapted for quickly assembling or disassembling panels to the configuration of a container, a building structure, or the like. Specifically, a unique flexible hinge arrangement is provided for vertical joints, while a quick-fitting locking arrangement is provided at all base horizontal joints. The base joint comprises a flange on the vertical member mating with a recessed beveled groove on the base member, and a plurality of screws threadably received in the flange of the vertical member having tapered heads slidably received in the beveled groove of the base member whereby when the screws are tightened, they lock into the groove of the base member and secure the vertical member to the base member.

3,563,579
STRUCTURAL JOINTS

Kenneth Reiner, 7875 Telegraph Road, Pico Rivera, Calif. 90660

Filed July 1, 1968, Ser. No. 741,597
Int. Cl. F16b *12/40*
U.S. Cl. 287—119 11 Claims

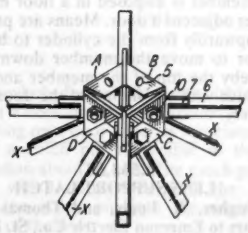


This invention relates to structural joints and more specifically to joints of a type wherein a plurality of elements have the terminal ends thereof attached to the tubular end portion of another element, one example being the attachment of three supporting legs to an upright post or standard. The structures of the invention are characterized in that the ends of the leg elements are of reduced cross section and inserted into the open tubular ends of post elements to provide economical, easily assembled and disassembled, or physically more attractive constructions. Various alternative means have been described for positioning the parts and for inhibiting relative movement thereof.

3,563,580
FRAME JOINT

Anthony Frederick Black, 50 Crofton Lane, Orpington, Kent, England

Filed Sept. 11, 1968, Ser. No. 759,133
Claims priority, application Great Britain, Oct. 16, 1967, Apr. 3, 1968, 46995/67;16101/68
Int. Cl. E04h *12/10;* F16b *9/02*
U.S. Cl. 287—189.36 1 Claim



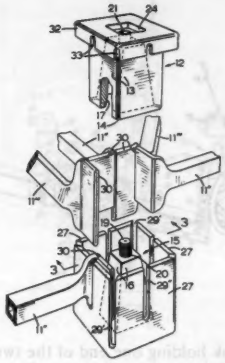
A jointing member for limbs of a frame is in the form of a hollow tapered unit open at its wider end, comprising more than two flat wall surfaces each inclined to each neighboring flat wall surface by an angle differing substantially from 90°, and some of said wall surfaces being apertured to receive bolting means. The member may be shaped as a truncated pyramid. In setting up a frame a flattened end of a frame limb is held between facing wall surfaces of two of said jointing members, by bolting means passing through the jointing members and the frame limb.

3,563,581
JOINT FOR STRUCTURAL ASSEMBLIES

Michael Sommerstein, 647 Vaughan Road, Toronto, 345, Ontario, Canada

Filed Sept. 29, 1969, Ser. No. 861,632
Int. Cl. F16b *7/04*
U.S. Cl. 287—189.36 9 Claims

A joint comprising a first member, and a second member which is axially urged relative to the first member by a nut and bolt assembly interconnecting the two members. One of the members has sidewalls spaced from the other member by a distance which is decreased by axial urging together of the members, and which is increased by axial urging apart of the members. The sidewalls are provided with openings through

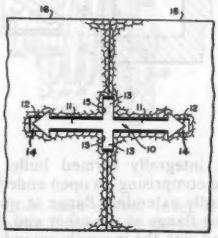


which end portions of structural members are disposed, these end portions being located between the sidewalls and the above-mentioned other member thereby to be securely clamped therebetween when the members are axially urged together, and to be released when the members are axially urged apart.

3,563,582
SPLINE JOINT

Harold F. Shroyer, Barrington, Ill., and Francis Jacob, New Castle, Pa.; said Jacob assignor to W. R. Grace & Co., Cambridge, Mass., a corporation of Connecticut

Continuation-in-part of application Ser. No. 550,024, May 13, 1966, now abandoned. This application Aug. 5, 1968, Ser. No. 750,177
Int. Cl. F16b *13/00*
U.S. Cl. 287—20.92 4 Claims



A spline joint for joining panels constructed of fragile resilient material such as expanded polystyrene, to form a rigid assembly. The panels have a seat comprising at least a portion running the length of each abutting end to be joined. The spline is a relatively hard strip having barbed end portions which are embedded in the walls of the seat. A central shoulder rests in the seat permitting the panels to be pushed together so that the spline itself is not seen in the assembly.

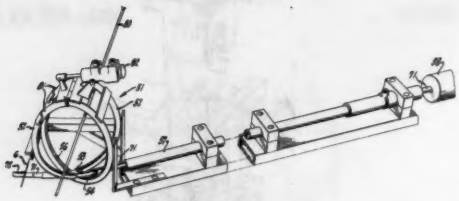
3,563,583
MACHINE FOR TIEING KNOTS

Joe P. Gentry, East Lansing, Mich., and George R. Giannini, Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 17, 1969, Ser. No. 817,000
Int. Cl. A01d *59/04*
U.S. Cl. 289—2 10 Claims

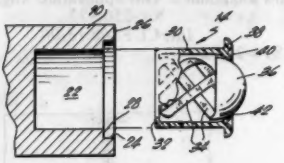
A machine for tying knots on a wire withdraws twine from a source and blows a length of the twine to lie between two

grippers located to hold the twine length near the ends thereof. The length is cut from the source and is engaged by a hook on the projected end of a flexible rod reciprocated within a convolute comprised of a longitudinally slit tube shaped like a clove hitch and encompassing the wire at a station thereon. The flexible rod withdraws through the con-



volute, the hook holding one end of the twine length, pulling that twine end from the adjacent gripper and pulling the twine length through the convolute and around the wire. The other gripper holds the twine length for final tensioning and tightens the knot so formed. The machine advances along the wire to the next station leaving the knot on the wire.

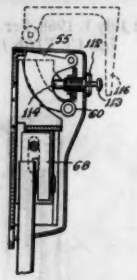
3,563,584
BULLET CATCH
Gilbert Schwartzman, 20 Wilmot Circle, Scarsdale, N.Y.
Filed Sept. 3, 1969, Ser. No. 855,156
Int. Cl. E05c *5/00, 19/02*
U.S. Cl. 292—71 **4 Claims**



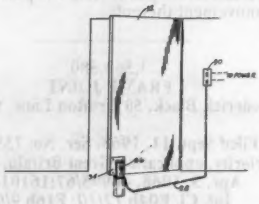
A one-piece integrally formed bullet catch preferably formed of nylon comprising an open ended cylindrical casing having an inwardly extending flange at one end and an outwardly extending flange at the other end. Helical springs are integrally formed with the inwardly extending flange and with a hemispherical head which extends partially through the opposite end and is resiliently held with the integral springs under compression by a swaged tapered retainer member which has a circular line of contact with the hemispherical head and which is resiliently engaged with the hemispherical head to hold the hemispherical head against accidental movement.

3,563,585
A LATCH UNIT FOR A DOOR LOCK
Nicholas A. Welch, West Hartford, Conn., assignor to Emhart Corporation, Bloomfield, Conn.
Original application Sept. 3, 1964, Ser. No. 394,275, now Patent No. 3,324,692, dated June 13, 1967. Divided and this application Oct. 28, 1966, Ser. No. 620,566
Int. Cl. E05c *3/16*
U.S. Cl. 292—92 **7 Claims**

This invention relates to door locks of the type generally referred to in the trade as "emergency exit locks," and more specifically to emergency exit locks of the vertical rod type such as generally include a top and a bottom latch unit and an intermediate, panic bar-actuated mechanism that is operatively connected to said latch units by rods disposed vertically on the door.

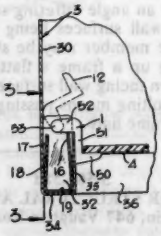


3,563,586
FLOOR BAR LOCK: FAIL SAFE
John M. Creamer, and Jane Catherine Creamer, 175 Duckpond Drive North, Wantagh, N.Y. 11793
Filed July 28, 1969, Ser. No. 845,452
Int. Cl. E05c *17/48, 17/58*
U.S. Cl. 292—144 **4 Claims**



A vertical member is disposed in a floor mounted vertical hollow cylinder adjacent a door. Means are provided to move the member upwardly from the cylinder to block movement of the door or to move the member downwardly into the cylinder whereby the top of the member and the top of the cylinder are flush with the floor and the door can be opened and closed freely.

3,563,587
LENS SUPPORT LATCH
Charles O. Hughes, St. Louis, and Thomas Akin, Clayton, Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Aug. 15, 1969, Ser. No. 850,451
Int. Cl. E05c *3/04, 19/12*
U.S. Cl. 292—194 **7 Claims**



In a lighting fixture in which the walls of a housing define an opening and a lens panel is mounted in the opening in

such a way as to leave a substantial span of the panel unsupported, said panel extending inboard of and spaced from the opening defining wall, a lens support latch is provided of steplike design, including a supporting ledge beneath and in supporting relation to the panel along the otherwise unsupported span of the panel, a riser part extending between the edge of the panel and the opening-defining wall of the housing, and a pivotally mounted upper step part. The latch is supported by the housing.

In the preferred embodiment, the housing wall has along its lower edge a U-shaped channel, the inner wall of which defines the opening, and the latch includes a mounting bracket seated in the channel of the housing. The mounting bracket has inner and outer broad sides lanced to provide anchoring points, and end walls projecting above the inner wall of the channel. The stepped latch member is pivotally supported by these end walls.

3,563,588

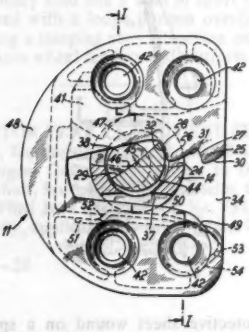
FASTENING MEANS FOR A MOTOR VEHICLE DOOR

Peter U. Putsch, Mannweiler Pfalz, and Karl D. Schoerken, Wuppertal-Ronsdorf, Germany, assignors to Fritz Keiper, Remscheid-Haston, Germany

Continuation-in-part of application Ser. No. 667,717, Sept. 14, 1967, now Patent No. 3,416,826. This application Oct. 7, 1968, Ser. No. 765,334

Int. Cl. E05c *3/00*

U.S. Cl. 292—198 **13 Claims**



A latch, particularly for vehicle doors, includes a keeper for mounting on a door frame and provided with a recess. A catch for mounting on a door which is associated with a door frame includes a catch pin receivable in the recess and adapted for rotation about its axis. The catch pin includes an abutment face which cooperates with the keeper upon penetration of the catch pin into the recess to thereby prevent opening of the door.

3,563,589

CLOSURE LATCH

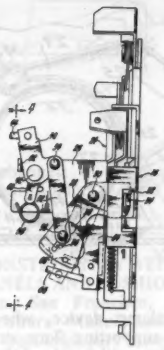
Stanley Kwasiborski, Jr., Hazel Park, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed Aug. 13, 1968, Ser. No. 752,262

Int. Cl. E05c *3/16*

U.S. Cl. 292—216 **6 Claims**

A vehicle body door lock includes a detent movable between holding and released positions with respect to a bolt. The inside remote handle is connected to a remote lever having an operating foot. A detent release lever is connected to the detent and includes a slot. A pin movable within this slot is located in and out of the path of the remote lever foot to thereby couple and uncouple the inside remote handle and the detent. The pin is connected to a shiftable link which in turn is pivoted to a garnish button operated lever located by an overcenter spring in either coupled or uncoupled position to thereby locate the pin either in or out of the path of movement of the remote lever foot. When the remote handle is operated to open the door, the detent release lever slot cams the pin and causes the overcenter spring to move the garnish button lever to uncoupled position. This provides for automatic inside remote handle free wheeling. If the garnish button lever is moved to coupled position when the door is open, and the door is then closed, reverse rotation of the bolt rotates the detent release lever sufficiently toward released position to cause the spring to go overcenter and move the garnish button operated lever to uncoupled position.



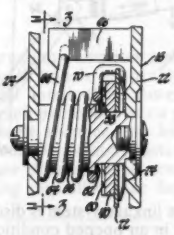
3,563,590

CLOSURE LATCH

Barthold F. Meyer, St. Clair Beach, Ontario, Canada, assignor to General Motors Corporation, Detroit, Mich.

Filed May 5, 1969, Ser. No. 821,664

U.S. Cl. 292—216 **4 Claims**



A vehicle body door lock detent lever is pivotally and slidably mounted on a stud carried by the lock frame. A combined compression and torsion spring normally biases the detent into detented engagement with the bolt and also holds serrations on the detent out of engagement with mating serrations on the stud. This spring is opposed by a Belleville washer and is normally stronger than the washer. If for any reason the washer becomes stronger than the spring, the detent shifts axially of the stud to engage the serrations.

3,563,591

DOOR CLAMP DEVICE

Ralph L. Kuss, Findlay, Ohio, assignor to R. L. Kuss Co., Inc., Findlay, Ohio

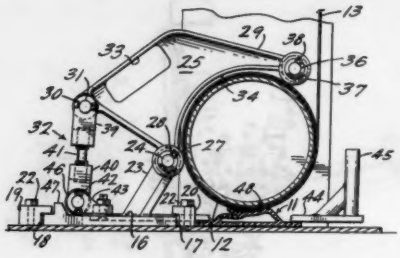
Filed Nov. 13, 1968, Ser. No. 775,325

Int. Cl. E05c *19/14*

U.S. Cl. 292—237 **10 Claims**

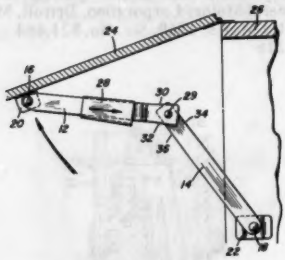
A clamp device for securing rolling doors or partitions in closed position. The device includes a pivot arm movable from an open position to a closed position extending over the bottom roller of the flexible door and means for locking the pivot arm in the closed position to resist upward movement of the door roller. Cooperating with the pivot arm is a flexi-

ble gasket below the roller which engages the roller through its axial length so that wind forces upon the closed door will cause the roller to engage and embed itself within the gasket.



The entire door clamp device, when desired, may be removed from the supporting floor structure and may be opened and closed from either side of the door.

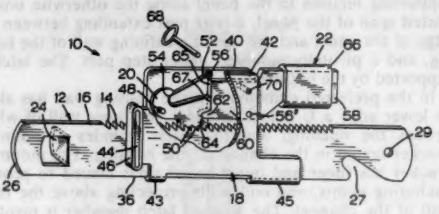
3,563,592
LOCKABLE FOLDING BRACE SYSTEM
Robert Preston, Falls Road, Monkton, Md. 21111
Filed Feb. 19, 1969, Ser. No. 800,444
Int. Cl. E05c *17/32;* **B65d** *43/24;* **B25g** *3/38*
U.S. Cl. 292—263 **4 Claims**



A lockable brace linkage system is disclosed for supporting a hinged structure in an opened condition. A jointed linkage is arranged to open from a folded condition to colinearity. The median joint is locked with a tapered sliding sleeve which moves over the common joined ends of the linkage. These ends are tapered in width, one inwardly and one outwardly, to facilitate the movement of the sleeve thereover and seat with wedge action. Another embodiment of the invention useful where the lock sleeve is too light weight to slide positively, incorporates a spring bias which assists the movement of the sleeve to the lock position and also tends to maintain the linkage in the folded position.

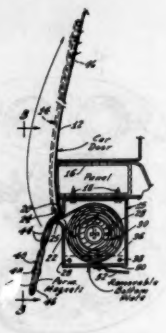
3,563,593
INSIDE DOOR LOCK
Edward J. Leier and Jack Edgar, Edmonton, Alberta, Canada, assignors to Peter J. Verbeke and John G. Abbott, Saskatchewan, Canada
Filed Mar. 17, 1969, Ser. No. 807,484
Int. Cl. E05c *19/18*
U.S. Cl. 292—296 **1 Claim**

An auxiliary lock for locking a door securely against a door jamb having a lock blade with a lug struck out near its outer end for engagement with the jamb, and a plurality of serrated teeth along one edge of the blade which are engaged by complementary teeth carried by a pivoted ratchet pawl mounted on a body member which is slideably mounted on the blade. The body member has an integral shoulder which engages the inside of the door, and also a rearwardly extending pivoted lever which when depressed disengages the



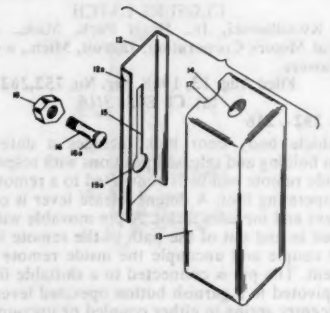
ratchet pawl from the teeth to permit removal of the body member.

3,563,594
RETRACTABLE FLEXIBLE CAR BODY PROTECTOR
Arnold B. London, 345 S. Rexford Drive, Beverly Hills, Calif. 90212
Filed May 2, 1969, Ser. No. 821,403
Int. Cl. B60j *11/00;* **B60r** *19/00;* **B61d** *39/00*
U.S. Cl. 293—1 **4 Claims**



A flexible protective sheet wound on a spring-actuated roller in a casing mounted below and at the lower edge of a vehicle body is extendible upward over the side surface of the body to be releasably held in place by permanent magnet means.

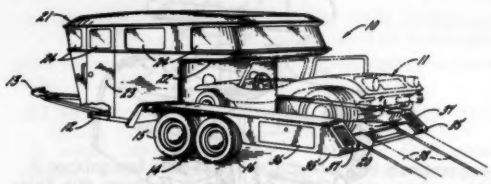
3,563,595
RESILIENT BUMPER GUARD FOR MOTOR VEHICLES
Coleman M. Slavney, 1618 Jefferson St., Madison, Wis. 53711
Filed Feb. 3, 1969, Ser. No. 795,980
Int. Cl. B60r *19/04, 19/08;* **B61f** *19/04*
U.S. Cl. 293—67 **2 Claims**



A bumper guard for motor vehicles having a rigid, channel-shaped, base plate imbedded in and bonded to a resilient

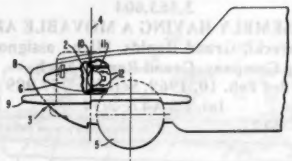
cushioning member. The base plate has a substantially vertical elongate slot with an enlarged end and the resilient cushioning member has a groove in the rear face thereof communicating with the slot for receiving the head of a mounting bolt for securing the guard to the bumper of a vehicle at the desired elevation.

3,563,596
CAMPER-HAULER
George Gordon Davis, 3500 Greenleaf Blvd., Elkhart, Ind. 46514
Filed Mar. 20, 1969, Ser. No. 808,864
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 **2 Claims**



A camper-hauler vehicle combining, on one trailer chassis, a body shell containing living facilities and a platform for carrying an auxiliary load like a boat or sport vehicle. The body shell is formed with a ledge portion overlying the platform and containing a sleeping area. Structure on each side of the platform defines wheel fenders and platform side rails.

3,563,597
MOTOR VEHICLE BODY END SECTION
Karl Wilfert, Gerlingen-Waldstadt, and Bela Barenyi, Stuttgart-Vaihingen, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed June 6, 1968, Ser. No. 734,939
Claims priority, application Germany, June 8, 1967, D53290
Int. Cl. B62d *25/00*
U.S. Cl. 296—28 **14 Claims**



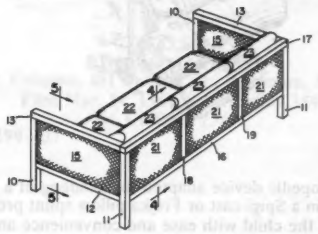
A motor vehicle body end section, particularly a front end section for passenger motor vehicles which is characterized by headlights arranged in a plane extending transversely to the vehicle longitudinal axis directly in front of the front wheels of the vehicle and by lateral body flanks which extend at an inclination to the vehicle longitudinal axis in the direction toward the front end of the vehicle whereby the lateral body flanks are so inclined that they are matched approximately to the boundary of the light cones of the headlights.

3,563,598
INSTALLATION FOR THE REDUCTION OF SOILING OF REAR LIGHTS OR THE LIKE AT MOTOR VEHICLE BODIES
Karl Wilfert, Gerlingen-Waldstadt, and Hans Gotz, Magstadt Wurttemberg, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Aug. 8, 1968, Ser. No. 751,238
Claims priority, application Germany, Aug. 8, 1968, 53790
Int. Cl. B60q *1/00*
U.S. Cl. 296—28 **14 Claims**

An installation for reducing the soiling of rear lights or the like at motor vehicle bodies by means of an air guide system which includes air guide channels extending on the inside of the body; air enters the air guide channels by way of inlet apertures provided laterally of the body and is discharged out

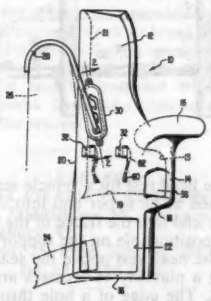
of the air guide channels by way of annularly shaped discharge apertures surrounding the rear lights.

3,563,599
FURNITURE CONSTRUCTION WITH REMOVABLE PANELS AND CUSHIONS
Jules M. Heumann, San Francisco, Calif., assignor to Metropolitan Furniture Manufacturing Company, San Francisco, Calif., fractional part interest to each partnership
Filed Mar. 17, 1969, Ser. No. 807,614
Int. Cl. A47c *4/30, 4/02*
U.S. Cl. 297—218 **13 Claims**



A furniture construction comprises a rigid frame having a plurality of upholstered panels removably mounted thereon by pairs of identical interlocking fastening means. Each fastening means of each pair comprises a plurality of resilient elements adapted to be snapped into locked position with respect to the elements of a mating fastening means. A plurality of cushions are detachably secured to the frame by means of belts having reversible snap fasteners attached to the ends thereof.

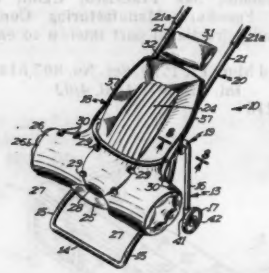
3,563,600
INFANT SAFETY CAR SEAT
Maurice Converse, 1311 Briarhill Drive, Akron, Ohio 44313
Continuation-in-part of application Ser. No. 657,992, Aug. 2, 1967, now abandoned. This application Mar. 11, 1969, Ser. No. 814,225
Int. Cl. A47d *1/10*
U.S. Cl. 297—254 **14 Claims**



An infant seat of the type adapted to be releasably secured to an automobile seat by means of the standard automobile

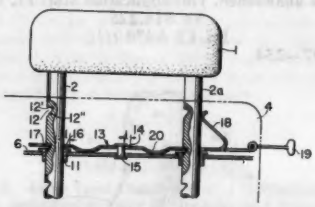
seat belt extending about the base thereof and an additional connecting device securing the top portion of the infant seat to the back of the automobile seat is constructed from a molded plastic shell-like member having a removable front portion which substantially encapsulates the child. The detachable front portion may be slidably or pivotally arranged with respect to the main seat portion and secured in place by means of a suitable quick release latch device. Additional child-restraining belt devices may be provided within the infant seat.

3,563,601
ORTHOPEDIC DEVICE
Patricia C. Dickey, South Watertown Road, Long Lake, Minn. 55356
Filed Oct. 23, 1968, Ser. No. 769,800
Int. Cl. A47c *1/08*
U.S. Cl. 297—390 **5 Claims**



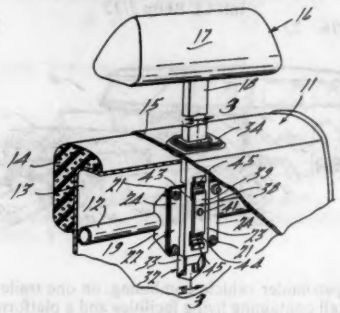
An orthopedic device adapted for handling of a child confined within a Spigi cast or Frejka pillow splint providing the handler of the child with ease and convenience and provide the child with a proper amount of support and adequate comfort, the orthopedic device having provision for use as an infant seat, a car seat, a stroller, a bed and a jumper.

3,563,602
ADJUSTABLE HEADREST FOR VEHICLE SEAT
Seizho Ohta, Toyota-shi, and Motokuni Kage, Aichi-ken, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan
Filed Oct. 2, 1968, Ser. No. 764,486
Claims priority, application Japan, Oct. 4, 1967, 84015
Int. Cl. A47c *7/36, 7/42*
U.S. Cl. 297—410 **9 Claims**



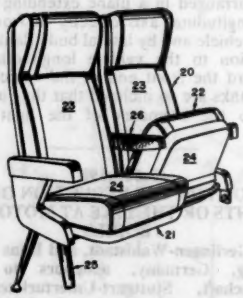
An adjustable head rest for a vehicle seat is formed by supporting rod fitted at its upper end into a head rest member and at its lower end into the frame of the vehicle seat. Means are adjustably positionable on the supporting rod for varying the height of the head rest above the seat. For such adjustable positioning a plurality of recesses are formed along the supporting rod. The edge of a hole through which the supporting rod passes is brought into engagement within one of the recesses under the biasing force of a resilient tongue in the retaining member propped against the supporting rod.

3,563,603
HEADREST ASSEMBLY
Joseph F. D'Aprile, Detroit, and Alfons Olada, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Sept. 4, 1969, Ser. No. 855,162
Int. Cl. A47c *7/36, 7/42*
U.S. Cl. 297—410 **14 Claims**



A headrest assembly for a cushioned seat back comprising a fixed bracket mounted within the seat back, a sleeve having an escutcheon at the upper end thereof, and a cushioned headrest member attached at one end to a support post. The sleeve is telescopically received within the bracket to a depth determined by engagement of the escutcheon with the upper surface of the cushioned seat back and the support post is telescopically and vertically adjustably received within the bracket and sleeve subassembly. Insertion of the support post into the sleeve causes the latter to be locked to the bracket.

3,563,604
CHAIR ASSEMBLY HAVING A MOVABLE ARMREST
Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed Feb. 10, 1969, Ser. No. 797,989
Int. Cl. A47c *7/54*
U.S. Cl. 297—417 **9 Claims**

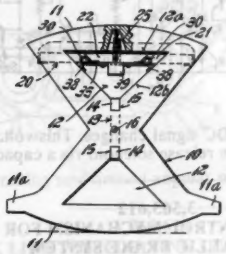


An armrest for a vehicle chair assembly in which the armrest is equipped with three linkage members to permit the armrest to fold completely out of the way, between the backs of the chairs, when the armrest is not needed.

3,563,605
ROCKING AND ROLLING LEG REST WITH LOCK MEANS

David Pinkas, 207 Wolfpit Ave., Norwalk, Conn. 06851

Filed June 30, 1969, Ser. No. 837,421
Int. Cl. A47c 9/12
U.S. Cl. 297—439 5 Claims

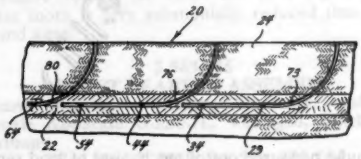


A rocking and rolling leg rest including end members provided with apertures having inclined supporting surfaces and a body supporting member resiliently and rollingly carried by the end members and normally located in an upper position, the supporting member having projecting tongues disposed in the apertures to engage the supporting surfaces of the apertures when the supporting member is tilted and moved downwardly and rolled sidewise under pressure applied to the top thereof. Rollers are provided on the support engaging portions of the tongues to facilitate tilting thereof and means can be provided to lock the supporting member in the upper position.

3,563,606
METHOD FOR IN-SITU UTILIZATION OF FUELS BY COMBUSTION

Howard V. Sears, Flat River, Mo., assignor to St. Joe Minerals Corporation, New York, N.Y.

Filed Mar. 24, 1969, Ser. No. 809,571
Int. Cl. E21c 43/00
U.S. Cl. 299—2 15 Claims



Subsurface combustible material, such as coal, can be burned in situ by providing a number of passages which extend downwardly from the surface and which extend to, and generally horizontally through, the combustible material, by forming a combustion chamber within said combustible material adjacent to and in communication with the ends of said passages, and by using one of said passages to supply air to said combustion chamber while using another of said passages to remove products of combustion from said combustion chamber. The wall of said combustion chamber, which is adjacent the inner ends of said passages, will progressively burn away, and thus cause said combustion chamber to "move" toward said passages; and the overburden adjacent said wall will provide a self-supporting overhang which will enable air to continue to enter said combustion chamber from said one passage and will enable products of combustion to move to and outwardly through said other of said passages — even though the overburden adjacent the opposite wall of said combustion chamber slumps down into said combustion chamber adjacent to said opposite wall, reach the area where that combustible material is being burned.

3,563,607
SUBAQUEOUS MINING

Bede A. Boyle, Newcastle, New South Wales, Australia, assignor to Laurice Winifred Boyle, Newcastle, New South Wales, Australia, a fractional part interest to each part interest

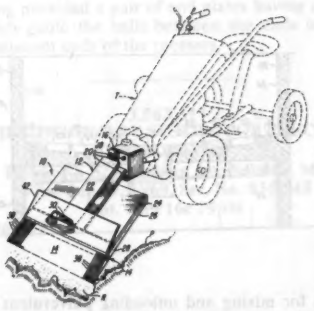
Filed Apr. 15, 1969, Ser. No. 816,200
Claims priority, application Australia, May 2, 1968, 37225/68
Int. Cl. E21c 45/00; E02f 3/88
U.S. Cl. 299—9 7 Claims

A subaqueous mining machine having an underwater suction head which has a suction pump mounted on it. The pump is driven by a high pressure air hose and a semibuoyant discharge hose is used to conduct the pumped slurry to a shore-based treatment means. The underwater head can be steerable by means of jet control pumps which are part of it.

3,563,608
RIPPING MACHINE

Daniel P. Crispino, 451 Fawcett St., Baltimore, Md. 21218

Filed Mar. 14, 1969, Ser. No. 807,359
Int. Cl. E04d 15/00
U.S. Cl. 299—37 5 Claims



An attachment for a tractor is provided which is used to thrust along the surface of a deck to break loose and remove old roofing paper from a roof. The machine, in addition to the tractor, consists of a thrust distributor assembly and a fork assembly. The fork is provided with a plurality of tapered teeth to break loose and remove the paper when driven forward by the tractor.

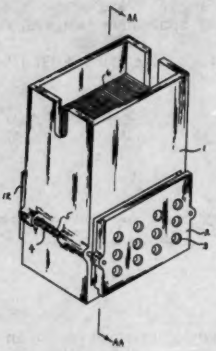
3,563,609
NOVEL FILAMENT STOCK BOX

John C. Lewis, Jr., Middlebury, Vt., assignor to Tucel Industries, Inc., Middlebury, Vt.

Filed Nov. 25, 1968, Ser. No. 778,741
Int. Cl. A46d 1/04
U.S. Cl. 300—7 3 Claims

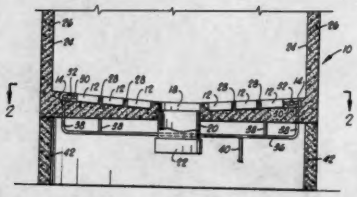
This invention relates to new and useful filament holding containers. More specifically, it is concerned with filament stock boxes which accept cut-to-length parallel synthetic fila-

ment in such a manner that picking devices can engage the filament at one end (longitudinal to the filament's length)



and remove at least two prearranged filament tufts prior to insertion of said tufts into a brush construction.

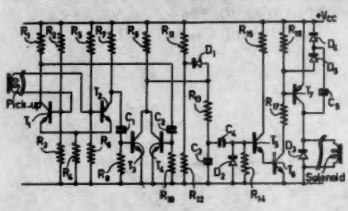
3,563,610
APPARATUS FOR MIXING AND UNLOADING PULVERULENT MATERIAL
A. J. Speegle and John F. Mason, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Filed Jan. 15, 1969, Ser. No. 791,435
Int. Cl. B65g *53/04*
U.S. Cl. 302—29 **8 Claims**



Apparatus for mixing and unloading pulverulent material stored in a silo comprising a plurality of aeration troughs positioned end to end in the floor of said silo forming at least one row therein. Said aeration troughs include self-contained air tight compartments for conducting air from one aeration trough to another thereby eliminating the necessity of separate air piping. The aeration troughs and air conducting compartments contained therein are connected together by means of resilient tubular connectors slidably secured in openings in the ends of said troughs.

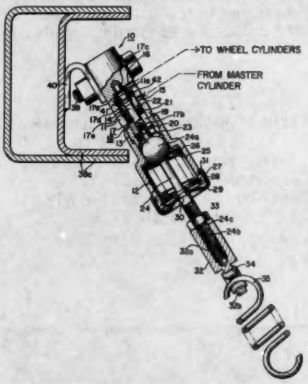
3,563,611
VEHICLE BRAKE SYSTEMS
Denis Sharp, Crawley, Sussex, England, assignor to U. S. Philips Corporation, New York, N.Y.
Filed Sept. 4, 1968, Ser. No. 757,255
Claims priority, application Great Britain, Sept. 4, 1967, 40348/67
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 **10 Claims**

An antilock brake control system that includes means for producing a constant amplitude DC signal for all wheel speeds above 6 m.p.h. When the speed drops below 6 m.p.h.,



the amplitude of the DC signal changes. This voltage change is coupled to the brake release solenoid via a capacitor.

3,563,612
LOAD SENSING CONTROL MECHANISM FOR VEHICLE HYDRAULIC BRAKE SYSTEM
Tosiaki Okamoto and Sinji Kawai, Kariya-shi, Japan, assignors to Aisin Seiki Company Limited, Aichi-ken, Japan
Filed May 2, 1969, Ser. No. 821,253
Claims priority, application Japan, May 4, 1968, 43/29975
Int. Cl. B60t *8/18, 15/00*
U.S. Cl. 303—22 **3 Claims**

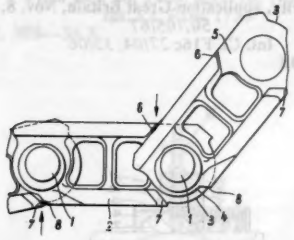


A hydraulic pressure control mechanism of load sensitive type inserted in a hydraulic piping extending between a hydraulic master cylinder and wheel brake cylinders of a powered vehicle for control of the pressure prevailing in the latter cylinders. The control mechanism is resiliently bridged between a chassis frame and a wheel axle of the vehicle through the intermediary of a load-sensing spring, and having a ball joint inserted between a valve piston and a motion transmitting rod for the piston.

3,563,613
ENDLESS TRACK WITH SEALED BEARING FOR THE JOINTS
Horst Schulz, Stossdorf, and Wilhelm Jansen, Bensberg-Refrath, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany
Continuation of application Ser. No. 625,150, Mar. 22, 1967. This application May 12, 1969, Ser. No. 827,085
Int. Cl. B62d *55/22*
U.S. Cl. 305—11 **2 Claims**

The present invention concerns an endless track in which the track links are pivotally interconnected and in which the pivot means for pivotally interconnecting the track links have associated therewith, elastic sealing means which permits a

limited angular movement only of adjacent links, while the sidewalls of the links are provided with abutment means for

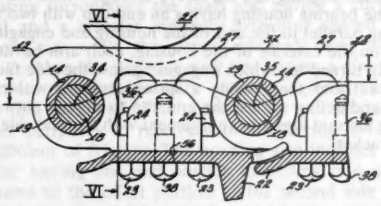


positively limiting said limited angular movement of adjacent links.

3,563,614
TRACK LINK WITH DRIVING LUG RELEASABLY SECURED TO TRACK SHOE

Roby A. Parks, Springfield, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 15, 1967, Ser. No. 690,921
Int. Cl. B62d *55/26*
U.S. Cl. 305—54 **2 Claims**

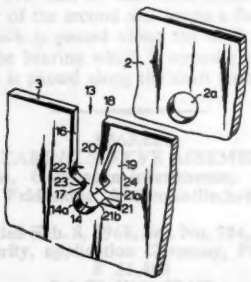


A drive lug is releasably secured to each shoe of an endless track to provide a center pitch track. The teeth of the drive sprocket engage the drive lugs instead of the track bushings. The relative velocity at which the drive lug impacts the sprocket tooth is very substantially reduced thus reducing noise and wear.

3,563,615
SHAFT BEARING ASSEMBLY

Eberhard Dobelin, Villingen, Germany, assignor to Kienzle Apparate G.m.b.H., Villingen, Black Forest, Germany

Filed May 2, 1969, Ser. No. 821,264
Claims priority, application Germany, May 3, 1968, P 17 50 449.3
Int. Cl. F16c *13/00*
U.S. Cl. 308—15 **5 Claims**

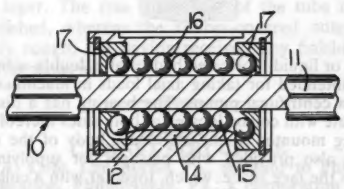


A journal portion of a shaft is inserted through an open slot in a support wall into an open bearing, and retained in the same by an arm which resiliently yields laterally during insertion of the shaft. The journal portion is formed by a circular groove preventing axial displacement of the shaft in the open bearing, and the other end of the shaft is inserted in axial direction into a bearing bore in another support wall. The longitudinally rigid arm blocks removal of the journal portion from the open bearing.

3,563,616
LINEAR MOTION BEARINGS

Ernest Leonard Allen, Dunstable, England, assignor to Rotax Limited, London, England

Filed Jan. 7, 1969, Ser. No. 789,523
Claims priority, application Great Britain, Jan. 22, 1968, 3221/68
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 **2 Claims**

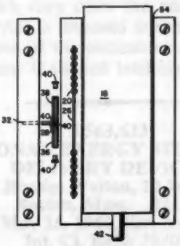


A linear motion ball bearing comprising a pair of telescopic members, the member having grooves which in association with grooves formed on the member, define tracks for ball bearings under load, there being formed in the member recesses which permit the return movement of the balls, there being provided a pair of end plates having channel portions which guide the balls between the ends of the tracks and the adjacent ends of the recesses.

3,563,617
ANTIFRICTION WAY SYSTEM FOR PRECISION INSTRUMENTS

James L. Pritchard, 52 Needham St., Norfolk, Mass. 02056

Filed June 9, 1969, Ser. No. 831,345
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 **8 Claims**



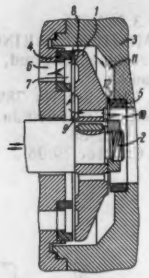
A linear, horizontal ball-bearing system including preloaded spring centering and spacing means for the balls comprising a flexible sheet perforated for ball retention and having spring connection to a post affixed to a way by compression springs positioned in an aperture in the spacing means.

3,563,618

GAS- OR LIQUID-LUBRICATED HYDROSTATIC DOUBLE-ACTION THRUST

Viktor Vasilievich Ivanov, Krasnoprudnaya ulitsa, 26, kv. 26, Moscow, U.S.S.R.

Filed Aug. 13, 1969, Ser. No. 849,659
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 1 Claim



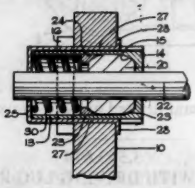
A gas- or liquid-lubricated hydrostatic double-action thrust bearing intended for taking axial loads in machines, for example, in centrifugal pumps. The bearing has a disc-shaped thrust plate with collars located at both sides thereof, the collars being mounted in the stationary body of the machine, which is also provided with passages for supplying power fluid into the face space, which, together with a collar, forms an annular chamber. The annular chamber through annular gaps communicates with a reduced pressure space and with a chamber located at the opposite face of the thrust plate, which, in turn, communicates with the reduced pressure chamber through a gap which is closer to the longitudinal axis of the thrust bearing than the said annular gaps.

3,563,619

BEARINGS

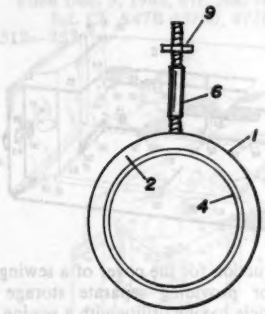
Philip H. Evans, Stourbridge, England, assignor to BSR Limited, Worcester, England

Filed Nov. 5, 1968, Ser. No. 773,421
Claims priority, application Great Britain, Nov. 8, 1967, 50,705/67
Int. Cl. F16c *27/04, 35/06*
U.S. Cl. 308—15 1 Claim



A bearing assembly for a rotating shaft comprising a support bracket having a substantially circular aperture in which is mounted a substantially cylindrical bearing housing having therein a self-aligning bearing sleeve through which the shaft passes, the bearing housing having an end cap with two arms projecting parallel to the axis of the housing and engaging in grooves on the exterior of the housing, each arm having an outwardly turned lug which engages against the side face of the bracket and there being a spring disposed within the housing and acting against the end cap to urge it outwardly and urge the said lugs into engagement with the said side face of the bracket.

3,563,620
FLUID SEALS
Richard H. Weichsel, Hudson, Ohio, assignor to The Apex Bearings Company, a corporation of Ohio
Filed Oct. 28, 1968, Ser. No. 787,284
Int. Cl. F16c 1/24
U.S. Cl. 308—36.3 9 Claims

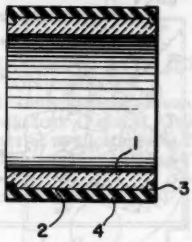


The combination of a shaft and a fluid seal including a housing surrounding the shaft and having a curved outer wall and a circular inwardly extending spaced first and second side walls, the second side wall being longer and thicker than the first side wall and having a circular offset portion arranged inwardly of the peripheral free end of the first side wall. The second side wall has a grooved inner periphery to receive a plastic O-ring having a low coefficient of friction. The housing also includes a porous collar having one end portion extending into and being secured to the offset portion of the second side wall and its other end portion engaging and being secured to the periphery of the free end of the first side wall to provide a circular channel to receive fluid which may be passed through the porous collar to form a fluid seal around the shaft.

The seal may be utilized in combination with a bearing for supporting the shaft and means secured to the seal and a machine housing is provided to maintain the seal spaced from but in close tolerance with the shaft with the longer and thicker side wall arranged adjacent to one side of the bearing and with the plastic O-ring on the inner portion of the thicker side wall protruding from the wall and engaging the shaft to prevent contaminants from passing into the bearing and for retaining the original lubricant provided by the manufacturer. If the bearing is open on both sides, a similar seal may be arranged on the opposite side of the bearing in which case the side walls of the second seal are reversed relative to the side walls of the first seal so that fluid passing through the porous collar of the second seal forms a fluid seal around the shaft which is passed along the shaft in a direction away from the bearing which is opposite to the direction that the fluid is passed along the shaft from the first seal.

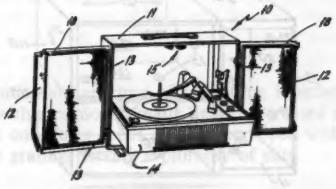
3,563,621
BEARING SLEEVE ASSEMBLY
Walter Gruss, Goppingen-Jebenhausen, Germany, assignor to Feldmuhle Aktiengesellschaft, Dusseldorf, Germany
Filed Feb. 8, 1968, Ser. No. 704,150
Claims priority, application Germany, Feb. 10, 1967, F 51,489
Int. Cl. F16c 27/00
U.S. Cl. 308—238 8 Claims

A bearing sleeve assembly consisting of a tube of commercially pure, polycrystalline, sintered aluminum oxide and an axially coextensive tubular rubber layer fixedly vulcanized to the outer face of the tube which has annular recesses at both axial ends so that the axially central portion of the tube projects into the conforming



rubber layer. The free inner face of the tube is ground and polished, whereas the rubber-covered outer face is relatively rough, not having received any finishing treatment after sintering.

3,563,622
CABINET STRUCTURE
Alfred A. Cote, Langhorne, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa., a corporation of Delaware
Filed Oct. 23, 1968, Ser. No. 769,827
Int. Cl. A47b 81/06
U.S. Cl. 312—8 5 Claims

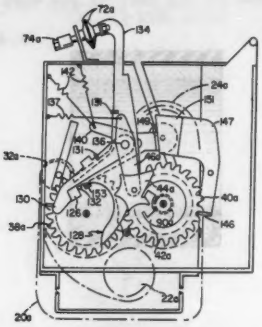


A unitary, molded plastic latching device for maintaining stored position of a pair of adjacent, hingedly mounted speaker enclosures of a portable phonograph cabinet. The enclosures are oppositely hinged, and are movable between a stored, latched position in which they cover the changer compartment, and a playing, unlatched position in which they open the changer compartment. The latching device is disposed intermediate the adjacent, free edge portions of the enclosures and includes a horizontally extending U-shaped latching member.

3,563,623
ROTATIONAL ENERGY STORAGE AND DELIVERY DEVICES
Richard Rhodes Walton, 10 W. Hill Place, Boston, Mass. 02114
Filed May 15, 1969, Ser. No. 824,799
Int. Cl. B65h 19/00
U.S. Cl. 312—38 14 Claims

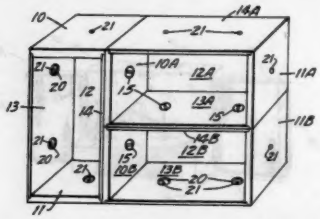
Towel dispensers using rotational energy storage and delivery devices, web drives using such devices, and such devices by themselves using helical springs which have upper and/or lower torque and stored-energy limits determined by the sizing of the spring and a co-operating surface. In towel dispensers a helical spring, receiving energy

from the pull-down of the towel by the user, accomplishes take-up (between uses) of portions of an extended



length of towel as well as take-up of the final tail of the towel without adding excessive resistance to pull of the towel by the user.

3,563,624
FAMILY ENTERTAINMENT CENTER
James Daniel Stice, 416 S. 4th St., Stillwater, Minn. 55082
Filed July 1, 1969, Ser. No. 838,132
Int. Cl. F16b *12/00*
U.S. Cl. 312—111 **9 Claims**



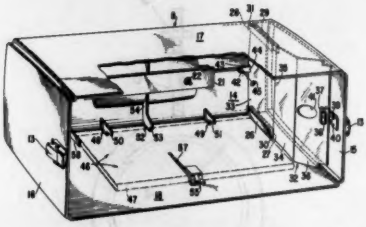
New concepts and basic units for utility centers are taught and permit versatile and convenient alteration of the total structure of utility centers as functional needs change. The approach taught is that of forming easily altered "Family Entertainment Centers" for games, arts, crafts, toys, and hobby activities.

The basic units utilized in the invention are receptacles open on one side. They have a volume represented by two cubes adjacent each other. Receptacles other than of two-cube volume are also provided; and these have such a structural relationship between the walls forming the same as to permit ready conversion into receptacles capable of modular mating with those of two-cube volume.

The basic preferred receptacle is one having five outer walls and eight outer-facing module surfaces on those walls. Any modular surface on any one receptacle may be mated to any modular surface of another to form the utility centers.

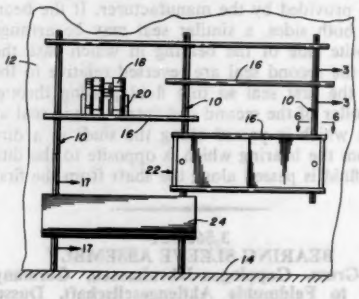
Disengageable fastening means are also provided to hold modular surface areas in mated position; and a variety of auxiliary items such as game boards and the like are employed in combination with the utility centers to form the total structure characterized herein as a "Family Entertainment Center."

3,563,625
STORAGE COMPARTMENTS FOR A SEWING MACHINE CARRYING CASE
George L. Zilg, Dunellen, and Henry J. Milan, Clark, N.J., assignors to The Singer Company, New York, N.Y., a corporation of New Jersey
Filed Oct. 25, 1968, Ser. No. 770,599
Int. Cl. A47b *21/00*
U.S. Cl. 312—208 **3 Claims**



A novel construction for the cover of a sewing machine carrying case for providing separate storage facilities therein for an article having utility with a sewing machine, such as a foot controller, an attachment box or the like, and for material such as an instruction manual of predetermined size. The storage compartment for the article is provided adjacent an end wall of the cover and includes a retaining panel constructed and arranged to form an open-ended compartment of sufficient size to receive and hold the article until it is needed for the sewing operation. Means are provided for releasably closing the open end of the compartment. A second storage facility is provided adjacent one of the longitudinal cover walls for holding an instruction manual or other material in sheet or pamphlet form of proper size, comprising a plurality of ribs proximate the top of the cover wall which cooperate with a lower support member to form a rack for supporting the instruction manual or the like material inside the cover of the carrying case.

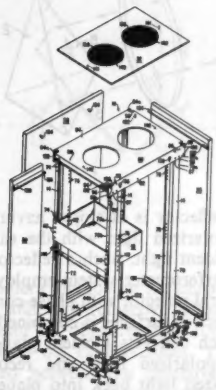
3,563,626
MODULAR ADJUSTABLE WALL SHELVING
Irwin J. Ferdinand, Glencoe, and Irwin R. Kulbersh, Niles, Ill., assignors to Hirsh Company, Skokie, Ill., a corporation of Illinois
Filed July 16, 1968, Ser. No. 745,287
Int. Cl. A47b *47/00*
U.S. Cl. 312—242 **11 Claims**



Modular knockdown shelving having vertical supports for vertically adjustable brackets that are received and concealed within the body portion of fabricated wooden shelves. The shelves are readily slidable over the brackets for holding them in adjusted position against removal and the brackets releasably hold the shelves in working

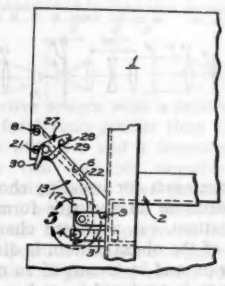
position against inadvertent dislodgement. The shelves are uniform and are constructed for open shelving, closed shelving or cabinets with or without sliding doors. They can serve also as desks both flat and inclined.

3,563,627
CABINET CONSTRUCTION
George E. Whipps, Boxboro, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Dec. 3, 1968, Ser. No. 780,775
Int. Cl. A47B *43/00, 47/00*
U.S. Cl. 312—257 22 Claims



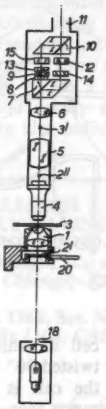
An improved cabinet employs a relatively few load bearing frame members which consist of inexpensive metal stampings formed so that they can be secured together using conventional welding techniques. Yet they still possess substantial structural rigidity and are configured specifically to enable the cabinet to withstand considerable sideways tilting and vertical impact forces. The frame members are formed initially with a large variety of fastening holes to give the user relatively great flexibility in the placement of shelves or drawers within the cabinet. Interchangeable panels are removably secured to the frame members to protectively enclose the cabinet contents.

3,563,628
LIMITED LOAD DRAWER LATCH
Lloyd Richard Poe, Beverly Hills, Calif., assignor to Hartwell Corporation, Los Angeles, Calif., a corporation of California
Filed Dec. 5, 1968, Ser. No. 781,560
Int. Cl. A47b *58/00, 95/02*
U.S. Cl. 312—320 5 Claims



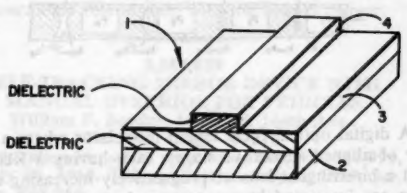
A limited load latch intended primarily for a drawer designed to carry electronic equipment and provided with separable connectors at its inner ends which are joined during the final closing movement of the drawer; the latch being incorporated in a handle pivotally connected to the outer, underside of the drawer and having a pair of elongated, laminated latch springs terminating in latch hooks capable of limited displacement on engagement with latch pins carried by the rack structure in which the drawer slides.

3,563,629
DEVICE FOR MEASURING PATH DIFFERENCES ON OBJECTS
Hermann Beyer and Gunter Schoppe, Jena, Germany, assignors to Jenaoptik Jena G.m.b.H., Jena, Germany
Continuation-in-part of application Ser. No. 566,292, July 19, 1966. This application June 27, 1969, Ser. No. 843,905
Int. Cl. G02b *21/14*
U.S. Cl. 350—13 4 Claims



The illumination aperture of a splitting interferometer operating with a monochromatic light is increased and the subsequent condenser focus plane is equipped with interchangeable gratings having a plurality of slits.

3,563,630
RECTANGULAR DIELECTRIC OPTICAL WAVEGUIDE OF WIDTH ABOUT ONE-HALF WAVELENGTH OF THE TRANSMITTED LIGHT
Dean B. Anderson, Whittier, Rudolf R. August, Laguna Beach, William A. McDowell, Orange, and Siegfried G. Plonski, Santa Ana, Calif., assignors to North American Rockwell Corporation, a corporation of Delaware
Filed Dec. 7, 1966, Ser. No. 599,833
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 13 Claims



A dielectric waveguide consisting of a ribbon of dielectric material of transverse dimensions near the wavelength of the infrared, ultraviolet or visible light to be

transmitted and which is mounted on a dielectric layer carried by a substrate. Said ribbon having an index of refraction greater than that of the dielectric layer and further being cladded with a metal layer.

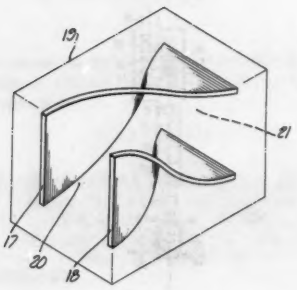
This invention relates to an optical waveguide and more particularly to a dielectric waveguide capable of propagating infrared, visible, or ultraviolet light, and having cross-sectional dimensions comparable to the wavelength of the guided light.

3,563,631

MODIFIED ELECTRO-OPTIC KERR CELL

John B. Sledge, Los Angeles, Calif., assignor to Metro-Goldwyn-Mayer, Inc., Culver City, Calif., a corporation of Delaware

Filed Nov. 25, 1968, Ser. No. 778,495
Int. Cl. G02b 5/30
U.S. Cl. 350—150 **9 Claims**



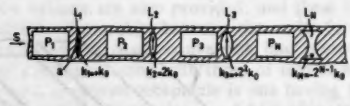
An electro-optical cell in which a pair of plates or electrodes are bent or twisted 90° so that their orientation at the exit face of the cell is perpendicular to their orientation at the entrance face of the cell. The cell is filled with a gel made up of nitrobenzene and methacrylate. A display screen or matrix made up of a plurality of such cells addressed on the horizontal and vertical axes by cathode ray tubes is also disclosed.

3,563,632

DIGITAL OPTICAL FOCAL LENGTH MODULATOR

Uwe Schmidt, Pinneberg, Germany, assignor to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware

Filed Apr. 7, 1969, Ser. No. 813,939
Claims priority, application Germany, Apr. 6, 1968, P 17 64 132.6
Int. Cl. G02f 1/26
U.S. Cl. 350—150 **5 Claims**



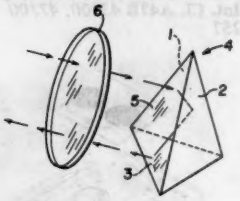
A digital optical focal length modulator where a number of aligned successive stages, each having a Kerr cell and a birefringent lens of progressively increasing curvature are immersed in a common electrolyte tank. Temperature compensation is achieved by making the sign of curvature of the strongest lens opposite to that of the other lenses in the modulator.

3,563,633

PHASE-COMPENSATED TRIHEDRAL REFLECTORS FOR INTERFEROMETER SYSTEMS

Paul B. Mauer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey

Filed June 27, 1968, Ser. No. 740,741
Int. Cl. G02b 27/28
U.S. Cl. 350—157 **5 Claims**



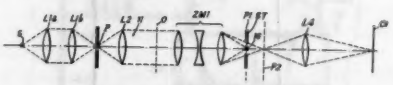
A trihedral reflector is disclosed having means for reflecting plane-polarized light with the same polarization state as the incident light. Such a reflector is particularly useful in an interferometer system employing a laser light source. A trihedral reflector with phase-compensating coatings on the reflective surfaces is combined with a quarter-wave plate which converts incident plane-polarized light into circularly-polarized light and reconverts reflected circularly-polarized light back into plane-polarized light, so that the final polarization state is the same as that of the incident light. Additional thin film coatings are provided to advance or retard the longitudinal phase of light incident in any one sextant with respect to light incident in adjacent sextants to compensate for a relative phase retardation or advancement which is effected according to the sextant in which the light is incident.

3,563,634

SYSTEM AND APPARATUS FOR IMPROVING THE CONTRAST OF OR FOR THE BINARISING OF ANALOGUE DENSITY PATTERNS

John Ronald Parks and Ralph Eric Rengger, Teddington, England, assignors to National Research Development Corporation, London, England, a British corporation

Continuation-in-part of application Ser. No. 579,268, Sept. 14, 1966. This application Dec. 14, 1967, Ser. No. 690,551
Claims priority, application Great Britain, Sept. 15, 1965, 39,435/65
Int. Cl. G02b 27/38
U.S. Cl. 350—162 **26 Claims**



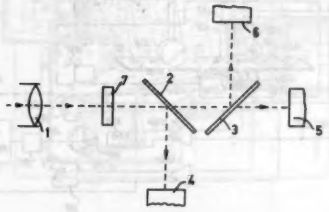
Optical arrangements for isolating chosen spatial frequency components of an analogue form density or intensity object pattern, e.g. a printed character, in which a transparency of the object pattern is disposed in a collimated light beam and by means of an optical system a diffraction pattern is produced in or beyond the Fourier plane, said Fourier plane containing a light stop having an annular pass aperture and the light passing said stop being imaged in a resultant image plane.

3,563,635

TELEVISION CAMERA HAVING A THICK BIREFRACTIVE PLATE BEFORE THE LIGHT-SPLITTING SYSTEM

Hendrik de Lang, Emmasingel, Eindhoven, Netherlands, assignor, by mesne assignments, to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware

Continuation of application Ser. No. 604,314, Dec. 23, 1966. This application Nov. 12, 1969, Ser. No. 871,577
Claims priority, application Netherlands, Jan. 8, 1966, 6600239
Int. Cl. G02f *1/24*
U.S. Cl. 350—171 2 Claims



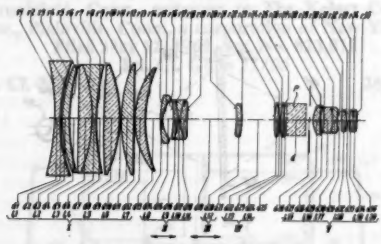
A television camera employing a dichroic mirror light-splitting system and a birefractive plate between the dichroic mirror and an objective lens for projecting an image of a scene in the camera tubes. The birefractive plate is positioned between the objective lens and the dichroic mirror and has a thickness sufficient to modify polarized light from the scene before it is incident on the dichroic mirror.

3,563,636

HIGH-SPEED VARIFOCAL OBJECTIVE SYSTEM

Karl Macher, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Rhineland, Germany

Filed Jan. 2, 1969, Ser. No. 788,427
Claims priority, application Germany, Jan. 5, 1968, Sch 41,799
Int. Cl. G02b *15/14, 17/00*
U.S. Cl. 350—184 2 Claims



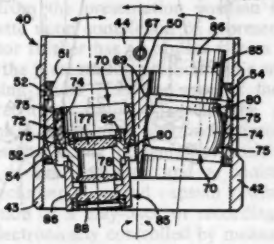
Varifocal objective system with a relative aperture of 1:1.8 and a varifocal ratio greater than 13:1, including a basic multilens objective and a four-component front attachment with two movable negative components bracketed by two substantially fixed positive components; the first component, which may be limitedly shiftable (in whole or in part) for focusing purposes, includes a negative front lens, a positive singlet, a negative doublet and three further positive singlets; the second component consists of a negative singlet followed by a negative triplet; the third component is a meniscus-shaped singlet; and the fourth component consists of two air-spaced positive singlets.

3,563,637

ADJUSTABLE PLURAL LENS SYSTEM

Harold G. Ferguson, Dayton, Ohio, assignor to Progressive Industries Corporation, Dayton, Ohio, a corporation of Ohio

Filed May 19, 1969, Ser. No. 825,618
Int. Cl. G02b *7/04*
U.S. Cl. 350—255 5 Claims



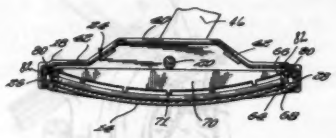
Multiple prints of different sizes are produced on a photographic printer incorporating a plurality of lenses each supported for independent universal angular movement within a ball which, in turn, is supported for universal angular movement within a common barrel. The ball is also rotatably and axially adjustable within the barrel, and the lenses are also individually adjustable on their optical axes.

3,563,638

MIRROR ASSEMBLY HAVING A TWO-PIECE MOLDING

William A. Panozzo, Chicago, Ill., assignor to Sure Plus Manufacturing Co., Chicago, Ill., a corporation of Illinois

Filed Aug. 26, 1968, Ser. No. 755,174
Int. Cl. B60r *1/06;* G02b *5/10*
U.S. Cl. 350—293 5 Claims



A mirror assembly for a vehicle having a convex mirror, a resilient two-piece molding engaging the edges of the convex mirror surfaces, a housing plate forming a pair of parallel vertical channels adapted to engage the resilient molding, a pair of end caps for the housing plate, and a mounting rod which passes through the end caps to secure the mirror assembly and attach the assembly to a pair of mounting members. A multivision mirror assembly including a convex mirror assembly as hereinabove described in a combination with a planar mirror fitted into a slot provided by the two-piece molding engaging the edges of the convex mirror and a housing having a channel for engaging an upper edge of the planar mirror and opposed longitudinally extending edges thereof to hold the planar mirror in an assembled relationship with the convex mirror.

3,563,639

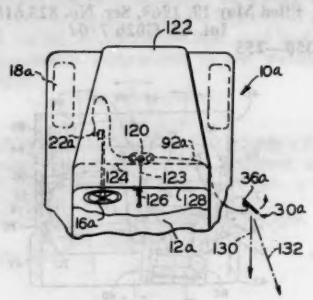
SELF-TRACKING MIRROR DEVICE WITH MANUAL OVERRIDE FOR VEHICLES

William F. Bowler, 1623 NE. 104th Ave., Portland, Oreg. 97220

Continuation-in-part of application Ser. No. 567,993, July 26, 1966. This application Aug. 6, 1969, Ser. No. 848,064
Int. Cl. G02b *5/08*
U.S. Cl. 350—307 7 Claims

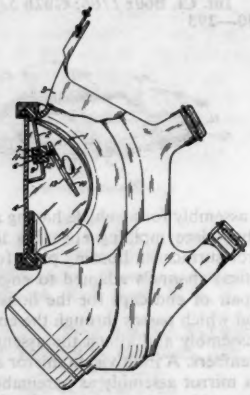
An outside rear-view mirror for a tractor-trailer vehicle combination wherein the angulation of the mirror changes

progressively during the course of a turn to provide the vehicle operator with continuous rear vision at and beyond the rear of the trailer. Mirror angulation changes are provided by an operable interconnection between the mirror



and the vehicle's steering assembly. A manual override is operably connected to the interconnection and is controlled by the operator in the vehicle cab to enable lane scouting and thereby facilitate lane changes during straight-ahead road travel.

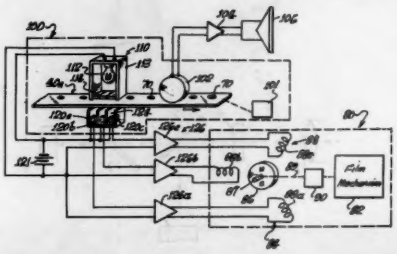
3,563,640
DEVICE FOR HOLDING SPECTACLES IN A MASK
Layton A. Wise, Washington, and Elmer E. Buban, Pittsburgh, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa., a corporation of Pennsylvania
Filed Aug. 12, 1968, Ser. No. 751,864
Int. Cl. G02c *3/02*
U.S. Cl. 351—158 **4 Claims**



A friction member is supported for vertical adjustment behind the window of a mask face piece, in which the device can be mounted, and is provided with an opening extending forward from its rear side. A spectacles frame behind the friction member is provided with a central support that extends forward into the friction member opening so that the frame can be adjusted forward and backward.

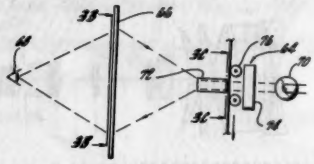
3,563,641
SOUND SYNCHRONIZING SYSTEM
Loren L. Ryder, Sherman Oaks, Calif.
(1147 N. Vine St., Hollywood, Calif. 90038)
Filed Aug. 5, 1968, Ser. No. 750,348
Int. Cl. G03b *31/00*
U.S. Cl. 352—17 **18 Claims**

Motion picture film and magnetic sound tape are synchronized by providing on the tape synchronizing signals of a form that can be sensed with the tape stationary and by sensing such signals in multiphase. The camera or projector is driven by multiphase current derived from the respective signal components, usings a step-synchronous motor. The tape can then be driven without compromising the sound quality, and the film maintains sync during stop, start and reversal of the tape. The sync signal of stationary readable form may comprise a punched hole or other visible mark for each picture frame. Such marks are readable by photosensors and



facilitate hand synchronization, especially during editing. The stationary readable signal may be pre-recorded on the tape and employed to drive the camera during recording and to drive the projector during reproduction. Or, if a camera-generated sync signal is magnetically recorded on the tape along with the sound, that signal can be later sensed magnetically and a stationary readable signal applied to the tape under its control. Such conversion permits many tapes recorded by previous processes to be reproduced by the present method.

3,563,642
PROJECTION SYSTEM
Arthur Rak, Altadena, Calif., assignor, by mesne assignments, to Bell & Howell Company, Chicago, Ill., a corporation of Illinois
Filed Aug. 28, 1967, Ser. No. 663,873
Int. Cl. G03b *21/10, 21/43*
U.S. Cl. 352—40 **13 Claims**



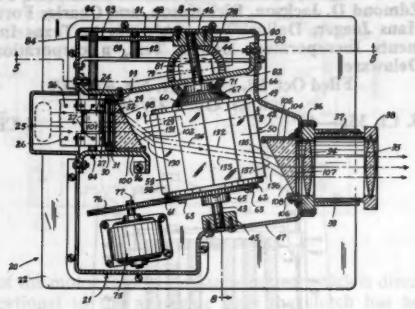
A projection system for use in presenting backlighted projections. In this system a motion picture projector equipped with a conventional right-hand sprocket drive engages a motion picture film along the sprocket holes provided on the right-hand edge of the film, but differs from other projection systems in that the physical locations of the lens and light source in the projector are reversed. With this arrangement light from the source is directed at and through the film from the film side normally adjacent the lens and exits through an aperture provided in the rear of the projector. Illumination emanating from the projector is then directed onto the backlighted screen without the interposition of any optical or reflective elements.

3,563,643

OPTICAL COMPENSATOR

Viktor Jeney, 15 Beverly Place, St. Louis, Mo. 63112

Filed Jan. 2, 1968, Ser. No. 694,990
Int. Cl. G03b *41/08*
U.S. Cl. 352—119 11 Claims



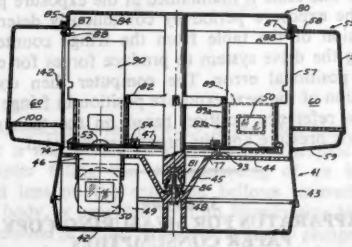
An optical compensator to enable continuous and uninterrupted motion of movie film in a movie projector, camera or viewer. A rotating multi-faced prism is oriented with its axis inclined to the direction of the rays passing through the film and lenses to etablish a greater effective prism diameter, thereby enabling use of a prism with faces equal in height to the height of the picture sections of the film. The prism enables the projection of stationary images from a film advanced with a uniform speed, synchronized with the rotational speed of the prism so that at all times the deviation of the beam of light caused by the refraction through the prism is equal with and opposite in direction to the displacement of the film. Triangular light refracting prisms on opposite sides of the rotary prism permit more compact construction of the optical compensator.

3,563,644

SOUND SLIDE PROJECTOR SYSTEM

William Castedello, Southington, and Ray L. Marquis, Brookfield, Conn., assignors to The Kalart Company Inc., Plainville, Conn., a corporation of New York

Filed May 12, 1969, Ser. No. 823,812
Int. Cl. G03b *31/06*
U.S. Cl. 353—19 26 Claims



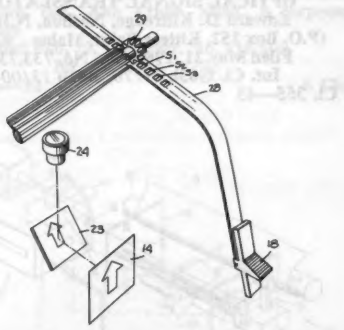
A sound slide projector system for projecting still pictures, particularly slides, and playing back sound recorded on magnetic tape or recording sound on such tape including a projector comprising a tray for accommodating a plurality of cassettes each including magnetic tape from which sound is to be played back or on which sound is to be recorded and a compartment for releasably retaining a slide to be projected. The tray has a plurality of compartments open at the bottom and each accommodating one of the cassettes and is movable with reference to a platform including a discharge slot. Stepwise movement of the tray brings successive cassettes into registry with the discharge slot to permit dropping of the respective slide into a presentation position. Each slide is returned from the presentation position into the respective cassette upon completion of a presentation. The sound projector further has an optical system for projecting a slide in the presentation position and a sound system for reproducing sound from the tape of the respective cassette or recording sound on such tape. A common drive mechanism including a play-back capstan pulls the tape in a cassette in the presentation position past the sound head of the projector and a common rewind mechanism including a rewind capstan rewinds the tape upon completion of a play-back or recording. A cycling mechanism electronically controlled by means of a signal of selected frequency recorded on the tape operates tray moving means, the sound system, the optical system and slide returning means in a predetermined sequence and time relationship. The cycling mechanism may also be utilized to control one or more slave projectors.

3,563,645

COMPACT MICROFILM READER

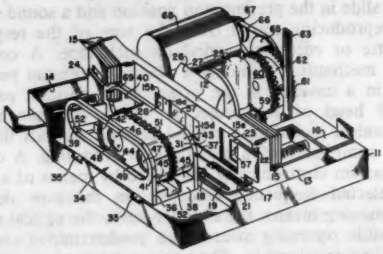
Frederick A. Burke, Mamaroneck, and Robert C. Schwartz, Jamaica Estates, N.Y., assignors to Motiva Ltd., Jamaica Estates, N.Y., a corporation of New York

Filed Mar. 13, 1969, Ser. No. 806,910
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 9 Claims



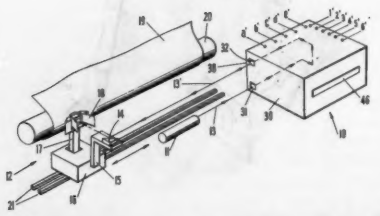
A microfilm reader adapter to project selected zones or frames of a microfilm record containing a greatly reduced image of a large map or other data, or an array of microfiche frames. The record to be projected is laminated to or printed on the transparent window of a rectangular carrier which is shiftable in X and Y coordinates with respect to the optical axis of an optical projection system arranged to concentrate light on a limited zone or frame on the record. The carrier is insertable between two pinions rotatably mounted at spaced positions at right angles to each other, the upper pinion engaging racks formed on the top face of one pair of parallel sides of the carrier, the lower pinion engaging racks formed on the under face of the other pair of parallel sides. Indexing means are provided to rotate the pinions and thereby incrementally shift the carrier to a position aligning a selected zone or frame on the record with the optical system.

3,563,646
LAP DISSOLVE SYSTEM FOR TRANSPARENCY PROJECTION
Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey
Filed Jan. 31, 1969, Ser. No. 795,466
Int. Cl. G03b 27/78
U.S. Cl. 353—83 10 Claims



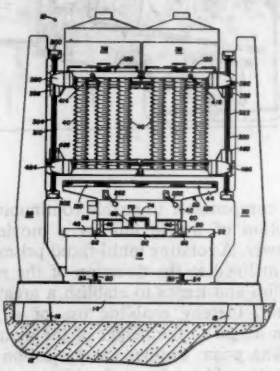
A dissolving projector includes two objective lens systems movable laterally while in alignment with corresponding laterally movable slides or the like to concurrently remove one slide and its respective lens system from a projection position as the succeeding slide and its lens system move into that position; whereupon the lens system beyond the projection position is transposed into alignment with the slide to be displayed next to complete the repetitive slide changing cycle.

3,563,647
OPTICAL SIGNAL TRANSLATOR
Edward D. Kittredge, Nashua, N.H.
(P.O. Box 152, Kittery Point, Maine 03060)
Filed May 21, 1968, Ser. No. 733,737
Int. Cl. G03b 27/70; B41b 13/00
U.S. Cl. 355—43 4 Claims



An optical signal translator is provided for use in printing and other applications. The signal translator has a first row of first selectors comprising a plurality of light reflecting surfaces for against deflecting the beam of light substantially parallel to the row. A second aligned row of second selectors comprises a plurality of aligned light reflecting surfaces for again deflecting the beam of light. An image means carries a plurality of images in predetermined relationship to the first and second rows. Means are provided for selecting one of the first plurality light reflecting surfaces and moving it into an operative position with respect to the beam of light to cause reflection of said beam of light through a selected one of said images to translate said beam of light into a light image. The optical signal translator is preferably used in conjunction with a parallel axis light beam which is deflected by the translator to produce a desired image which can be in turn converted into a recorded image.

3,563,648
STEP AND REPEAT CAMERA WITH COMPUTER CONTROLLED FILM TABLE
Leonard Baggaley, Richardson, Samuel A. Harrell, Plano, Edmond D. Jackson, Richardson, and Charles Fort and Hans Jaeger, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware
Filed Oct. 18, 1967, Ser. No. 676,315
Int. Cl. G03b 27/44
U.S. Cl. 355—46 6 Claims

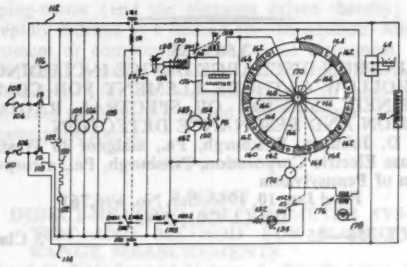


A film support table is movable in the X and Y coordinate directions by X and Y drive systems. A laser interferometer and fringe counter detects movement of the table in the X and Y coordinate directions by fringe counts. A projection system simultaneously projects a plurality of images onto the film carried by the table after the table is moved to each of a plurality of predetermined exposure positions. A reference detector system detects when the table is at a zero reference position and resets the counters. A digital computer is programmed to compute the coordinate of each exposure position and then, based on the current barometric pressure, compute the distance in fringe counts from the reference position to the first exposure position. The computer then operates the drive system in such a manner as to move the table to the exposure position by continuously computing the position and velocity of the table from the readings of the fringe counters. The table is maintained at the exposure position during the exposure period by continuously determining the position of the table from the fringe counters and operating the drive system to produce forces for correcting the positional error. The computer then computes the location of the next exposure position in fringe counts from the reference position based on the then current barometric pressure and the procedure repeated.

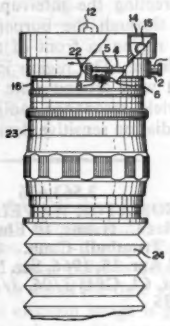
3,563,649
APPARATUS FOR MEASURING COPY PAPER CONSUMPTION
Richard J. Biscow, Mount Vernon, N.Y., and Harold W. Timmerman, Ridgewood, N.J., assignors to Savin Business Machines Corporation, New York, N.Y., a corporation of New York
Filed July 11, 1968, Ser. No. 744,019
Int. Cl. G03b 27/48
U.S. Cl. 355—50 14 Claims

Apparatus for producing a direct measure of the amount of copy material consumed in a copy machine in which

actuation of a copy paper feed clutch under the control of an original passing through the machine energizes a 60 r.p.m. motor which pulses a counter once each revolution of the motor to provide a total count, which is directly proportional to the aggregate time the clutch has been energized and thus is directly proportional to the amount of copy material used.

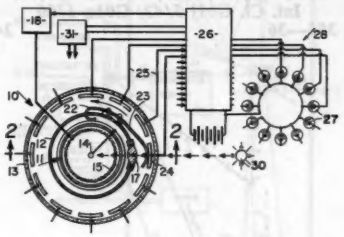


3,563,650
FLASH DISCHARGE LAMP DEVICE FOR PHOTOGRAPHY
Keno Okuno, Kawasaki-shi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan, a corporation of Japan
Filed Aug. 5, 1968, Ser. No. 750,055
Claims priority, application Japan, Aug. 26, 1967, 42/73,111
Int. Cl. G03b *27/76*
U.S. Cl. 355—71 **3 Claims**



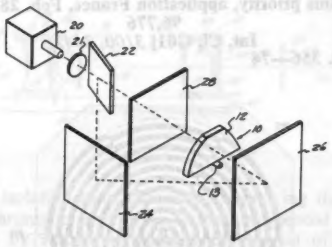
A flash discharge lamp device is provided for a camera lens for a magnifying or close-up photographic device. An adapter fitting the lens mounting of an inversely mounted lens on the extension bellows secured to the camera body, is provided with an illuminating lamp and a flash discharge lamp. A push button and plunger, upon depression, closes a switch to complete an electrical circuit for the illuminating lamp and operates a diaphragm lever to open the lens diaphragm to its full aperture to permit focussing of the illuminated object to be photographed. Release of the push button opens the switch and permits the diaphragm to be closed down by the diaphragm spring mechanism of the lens to a preset opening and permits a flash exposure to be made in the usual manner.

3,563,651
AIRCRAFT WARNING SYSTEM
Luis W. Alvarez, Berkeley, and William E. Humphrey, Oakland, Calif., assignors to Optical Research and Development Corporation, Oakland, Calif., a corporation of California
Filed July 22, 1968, Ser. No. 746,375
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 **13 Claims**



An aircraft warning system in which a light source generates light in the wavelength range of 2,000 A. to 3,000 A. and a detector constructed and arranged to sense light only in the wavelength of a source is employed to render activation of a warning device upon detection of a light source. The detector and warning device are used in combination with sensing elements to register bearings of the light source.

3,563,652
HOLOGRAPHIC METHOD OF PHOTOELASTIC STRESS ANALYSIS
Robert Powell, Ann Arbor, and Joseph Der Hovanesian, Farmington, Mich., assignors, by mesne assignments, to GCOptronics, Inc., Ann Arbor, Mich., a corporation of Delaware
Filed Feb. 13, 1967, Ser. No. 615,809
Int. Cl. G01b *11/16*
U.S. Cl. 356—32 **6 Claims**



To determine the pattern of stress (or strain) distribution in a member under stress a transparent model of a member is formed and a first exposure hologram or photographic record of the interference pattern between coherent light passed through the model and light directly from the coherent source is made. The model is then stressed and a second exposure is recorded on the same hologram. After developing, the hologram is appropriately illuminated to provide a visual reconstruction of the object with fringe lines visible which constitute the interference pattern between the light rays emanating from the object during the two exposures. These fringes may also be viewed as the interference pattern between the light which reconstructs the images of the object as seen during the two exposures. These fringe patterns contain information relating to both the locus of lines wherein

the difference between the principal stress is constant and the locus of lines wherein the sum of the principal stress is constant.

3,563,653

PHOTOMETRIC DETERMINATION OF SPECIFIC SURFACE OF FINELY DIVIDED MATERIAL

Edward C. M. Chen, Houston, Tex., assignor to Ashland Oil, Inc., Houston, Tex., a corporation of Kentucky

Filed May 19, 1969, Ser. No. 825,877
Int. Cl. G01j *3/42*; G01n *1/00*
U.S. Cl. 356—36 **24 Claims**

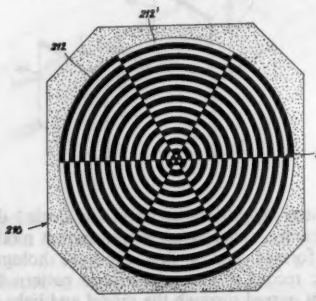
The surface area of finely divided particulate solid matter is obtained by a photometric determination of the amount of a material adsorbed out of a solution by the solid matter.

3,563,654

SPECTROMETRIC APPARATUS WITH ROTARY ENTRANCE OR EXIT GATE

Paul Jean E. Vermande, Paris, France, assignor to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon, Bagneux, France

Filed Feb. 26, 1968, Ser. No. 709,167
Claims priority, application France, Feb. 28, 1967, 96,776
Int. Cl. G01j *3/00, 3/42*
U.S. Cl. 356—74 **10 Claims**



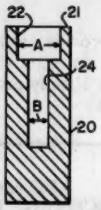
A spectrometer with matching entrance and exit gates each divided into two multiplicities of zones of different transmissivity for radiation to be analyzed, has means for rotating one of the gates about its axis to generate a rapidly varying output voltage with a fundamental frequency related to the speed of rotation whenever the radiant energy includes flux of a predetermined adjustment wavelength, i.e. that wavelength with which an interposed prism or diffraction grating produces an image of the entrance gate coinciding exactly with the exit gate. Each of these gates has a circular area angularly subdivided into an even number of identical sectors and radially subdivided by concentric circles defining together with the sector boundaries a multiplicity of arcuate zones, these zones being alternately transparent and opaque or reflecting and nonreflecting for the flux to be analyzed.

3,563,655

ELECTRON DISCHARGE DEVICE INCLUDING HOLLOW CATHODE ELEMENT FOR COMBINED EMISSION OF SPECTRAL RADIATION AND RESONANCE DETECTION

John D. Johnson, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Jan. 10, 1968, Ser. No. 696,761
Int. Cl. G01j *3/42*
U.S. Cl. 356—85 **3 Claims**



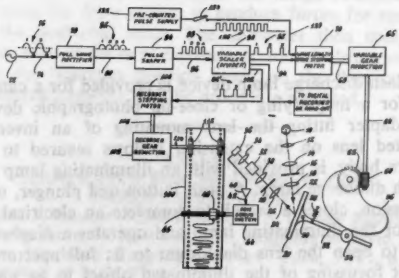
This invention relates to a spectral radiation system including an electron discharge device having an anode element and a cathode element for emitting a beam of spectral radiation, a suitable lens for focusing the spectral radiation through a suitable device such as a burner for disassociating the atoms of the sample material to be analyzed into ground state atoms, and a suitable reflecting device for redirecting the interrupted beam of spectral radiation back through the burner and the lens to be focused onto a region in front of the hollow portion of the cathode element. The region in front of the hollow portion is filled with ground state atoms which tend to fluoresce and yield resonance radiation which is sensed by a suitable radiation sensitive device.

3,563,656

MONOCHROMATOR WAVELENGTH DRIVES

Charles C. Helms, 19 Elmstad Road, Trumbull, Conn. 06611

Filed Apr. 15, 1966, Ser. No. 542,887
Int. Cl. G01j *3/06, 3/18, 3/42*
U.S. Cl. 356—96 **7 Claims**



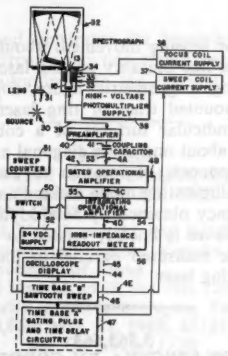
A stepping-motor (of the type which moves in a series of discrete small increments) drives the dispersive element of an optical monochromator, for example, through

a variable gear reduction transmission rotating a cam, which in turn angularly moves a lever arm rigidly connected to, say, a diffraction grating. The stepping-motor may be moved at various continuous rates by supplying a series of evenly spaced (in time) pulses at any particular desired rate. Alternately, by providing a "burst" or "train" of a predetermined number of closely spaced pulses, the stepping-motor (and the elements driven thereby) may be rapidly indexed to a desired specific position. Another instrument or component of the same instrument, such as the chart recorder or other readout may be readily synchronized with the monochromator stepping-motor, by utilizing as its drive a second stepping-motor, fed from the same pulse source.

3,563,657
DIRECT-READING SPECTROMETER SYSTEM AND METHOD FOR NARROW RANGE MEASUREMENTS

Richard N. Kniseley and Velmer A. Fassel, Ames, Iowa, and Danold W. Golightly, Urbana, Ill., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa, a corporation of Iowa

Filed Aug. 9, 1968, Ser. No. 751,404
Int. Cl. G01j *3/06, 3/42*
U.S. Cl. 356—98 **6 Claims**



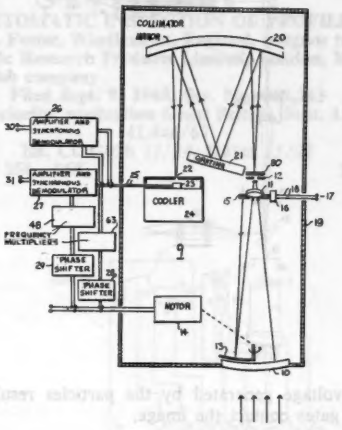
An electron image of the dispersed spectral lines characteristic of a chemical element being analyzed is periodically scanned across a slit-like aperture of an image dissector phototube. A gating pulse is delayed relative to the start of each sweep to signal the time when the narrow range of interest in the electron image is passing through the slit; and the gating pulse enables an amplifier receiving the output signal of the phototube to selectively amplify only this narrow range. The signal from the gated amplifier is then fed to an integrator circuit which stores the gated signal for a known number of sweeps.

3,563,658
SPECTRORADIOMETER FOR DETECTING ATMOSPHERIC CONTAMINANTS

Marc George Dreyfus, Stamford, Conn., assignor, by mesne assignments, to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware

Filed Oct. 22, 1965, Ser. No. 500,881
Int. Cl. G01j *3/42*
U.S. Cl. 356—97 **15 Claims**

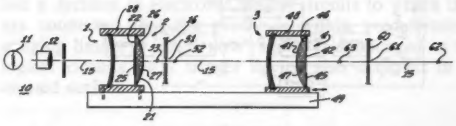
In a spectroradiometer particularly adapted to determine the occurrence of atmospheric contaminants, means are provided to produce signals that are proportional to the sum and difference between the difference of atmospheric and reference radiation intensity at two closely spaced wavelengths. The sum and difference signals can be directly produced by proper design of the spectroradiometer chopper. While reduction of thermal effects is reduced by this system, still further reduction can be obtained by employing a filter having a thermally responsive transmittance in the spectroradiometer.



3,563,659
MONOCHROMATOR

James S. Thompson, 10482 Holman Ave., Los Angeles, Calif. 90024

Filed Feb. 8, 1968, Ser. No. 704,149
Int. Cl. G01j *3/12*
U.S. Cl. 356—99 **9 Claims**



A focal isolation monochromator employing the principle of chromatic aberration in that sequential image formations by refraction magnify the spread of image points of different wavelengths as formed by the imaging system along the optical axis and from a heterochromatic light source.

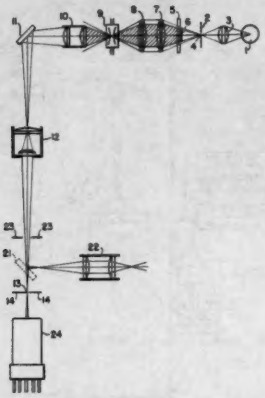
3,563,660
METHOD AND APPARATUS FOR DETERMINING PARTICLE SIZE AND SHAPE

Sidney Soloway and Warren G. Gillingham, Pittsburgh, Pa., assignors to Fisher Scientific Company, Pittsburgh, Pa., a company of Pennsylvania

Filed Mar. 2, 1967, Ser. No. 620,028
Int. Cl. G01n *15/02, 21/00;* **G01b** *11/28*
U.S. Cl. 356—102 **13 Claims**

An apparatus and method for determining the size and shape of small particles. Light scattered by each particle is focused to form an image; a photomultiplier then converts the light into a pulse of current that varies

with size of the particle. The size and shape of the image can be measured mechanically with slit gates. A decrease



in the voltage generated by the particles results when the slit gates contact the image.

3,563,661

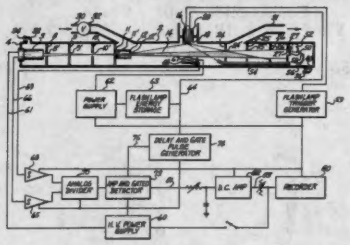
INTEGRATING NEPHELOMETER

Robert J. Charlson and Norman C. Ahlquist, Seattle, Wash., assignors, by mesne assignments, to The Battelle Development Corporation, Columbus, Ohio, a corporation of Delaware

Continuation-in-part of application Ser. No. 729,812, May 16, 1968. This application Aug. 29, 1969, Ser. No. 854,214

Int. Cl. G01n *21/00, 21/12, 21/21*

U.S. Cl. 356—103 **15 Claims**



An improved integrating nephelometer applicable for mobile or static monitoring of the atmospheric extinction coefficient by measuring the extinction coefficient due to the scatter of light in a sample of atmospheric aerosol. A flashlamp aims a light pulse directly at a reference phototube through the sample, and indirectly at a measuring phototube which has a predetermined beam pickup. The intensity of the light pulse reaching the reference phototube establishes a standard against which the intensity of the light pulse scattered by the aerosol may be measured. The two phototube output signals are integrated, then passed through an analog device which divides the measuring phototube signal by the reference phototube signal to eliminate variations in readings due to fluctuations in light intensity. The analog device output is a voltage pulse which is amplified and passed through a delayed gate circuit which allows the light pulse to be completed and the analog divider to stabilize. The delayed gate circuit samples and holds the voltage level of the pulse, producing a DC signal which is averaged to provide an indication directly proportional to the extinction coefficient due to light scattering. Secondary indicating scales are provided for mass concentration and visual range. Modifications allow use of the nephelometer for measuring the wavelength dependence of the extinction coefficient due to light scattering and for the measurement of the properties of deliquescent aerosols.

3,563,662

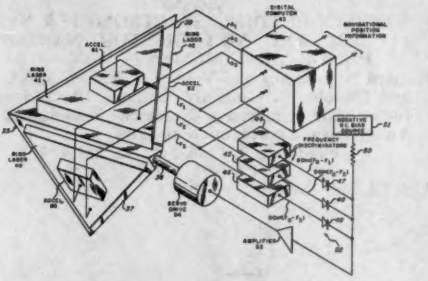
APPARATUS FOR SENSING MOVEMENT ABOUT A PLURALITY OF AXES

Willis G. Wing, Glen Head, N.Y., assignor to Sperry Rand Corporation, a corporation of Delaware

Filed June 13, 1966, Ser. No. 557,301

Int. Cl. G01b *9/02*

U.S. Cl. 356—106 **5 Claims**



Apparatus for sensing movement about a plurality of axes including a like plurality of ring lasers mounted on surfaces defining a geometric figure, for example, an orthogonally mounted triad of ring lasers mounted on mutually perpendicular surfaces of a cube wherein the cube is rotated about one of its diagonal axes for imparting equal components of rotation to each of the ring lasers thereby eliminating mode locking and assuring that the beat frequency obtained by heterodyning the contra-rotating light waves is linearly related to the component of rotation rate measured parallel to the input axis of the respective ring laser.

3,563,663

ANALYSIS OF SPECTRA BY CORRELATION OF INTERFERENCE PATTERNS

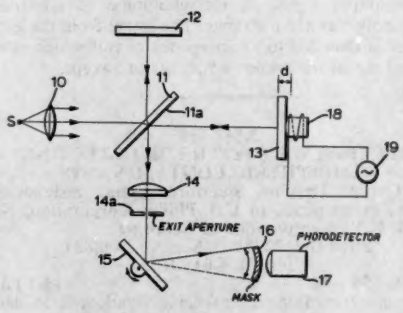
Anthony Rene Barringer, Willowdale, Ontario, Canada, assignor to Barringer Research Limited, Rexdale, Ontario, Canada, a corporation

Filed July 13, 1967, Ser. No. 653,228

Claims priority, application Great Britain, July 13, 1966, 31,363/66

Int. Cl. G01b *9/02*

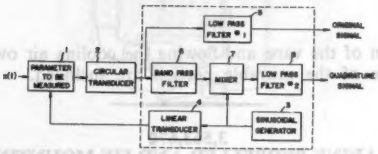
U.S. Cl. 356—106 **4 Claims**



A scanning interferometer of the Michelson type wherein the path length difference of the two interfering beams

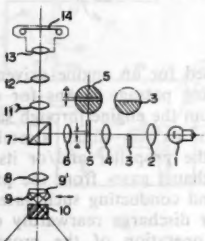
in the interferometer is continuously varied in a predetermined manner, and a rotatable mirror is provided for scanning or dispersing the emergent, intensity modulated light synchronously with the varying path length difference across a mask containing a series of lines corresponding to a pattern produced by intensity modulated light of known spectral content.

3,563,664
METHOD AND APPARATUS FOR RESOLVING TRANSDUCER AMBIGUITY
James W. Campbell, 1205 Madeira SE., Albuquerque, N. Mex. 87108, and Virgil Erbert, Albuquerque, N. Mex.; said Erbert assignor to said Campbell
Filed Nov. 9, 1967, Ser. No. 681,686
Int. Cl. G01b 9/02; H01s 3/00
U.S. Cl. 356—106 10 Claims



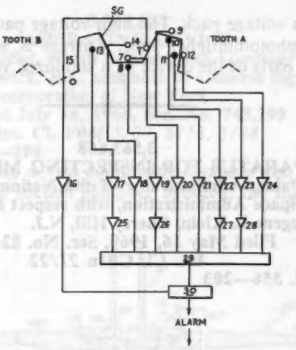
A method and apparatus for resolving ambiguity in the output of circular function transducers by generating a signal in quadrature with the original transducer output is disclosed.

3,563,665
OPTICAL SYSTEM FOR EXAMINING SURFACE PROFILES OF OBJECTS BY THE OPTICAL INTERSECTION METHOD
Kinji Takahashi, Yokohama-shi, and Jinichi Kato, Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan, a corporation of Japan
Filed May 13, 1968, Ser. No. 728,392
Claims priority, application Japan, Feb. 7, 1968, 43/8,050; Mar. 22, 1968, 43/21,950
Int. Cl. G01b 11/30
U.S. Cl. 356—120 5 Claims



An optical system is provided for examining and photographing surface profiles of specimens by the optical intersection method. A slit element is provided for projecting light rays onto the surface of the specimen to be examined by a mirror or prism on the optical axis of an objective lens, through the objective lens and through a double pentaprism arrangement onto the specimen surface. The specimen reflected light rays again pass through the double prism arrangement and the objective lens to an eyepiece or the objective lens of a camera. The arrangement is such that the double pentaprism or the slit element is movable transversely relative to the optical axis.

3,563,666
AUTOMATIC INSPECTION OF PROFILES
David B. Foster, Windlesham, England, assignor to North Atlantic Research Products Limited, London, England, a British company
Filed Sept. 9, 1968, Ser. No. 758,313
Claims priority, application Great Britain, Sept. 11, 1967, 41,446/67
Int. Cl. G01b 11/24; G01m 13/02
U.S. Cl. 356—168 1 Claim

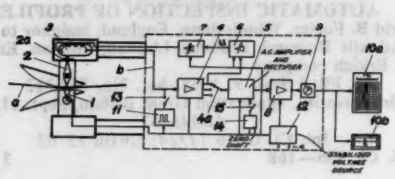


This invention relates to automatic inspection of profiles regularly projecting from a body, examples of which are the inspection of screw threads or gear teeth. In accordance with the invention, a magnified image of the profile is projected onto a receiving surface that includes pairs of photoelectric cells disposed in positions relatively indicative of undersize and oversize dimensions of an ideal profile. These photoelectric cells then establish a decision in electronic logical circuits to which they are connected that the profile is within predetermined gauging limits. A "read now" signal is announced to the logical circuits by a trigger device also disposed in or on said surface.

3,563,667
DEVICE FOR MEASURING THE FORMATION AND THE WIRE MARK OF PAPER
Jouni Aslak Koskimies, Vekarokatu 1, as. 1, and Antti Ilmari Lehtinen, Tourula 27, both of Jyvaskyla, Finland; Esko S. Rautila, Lentajantie 1, Harmala, Tampere, Finland; and Timo H. Kuusisto, Peltolamminkatu 2 I 60, Koivistonkyla, Finland
Filed Feb. 16, 1968, Ser. No. 706,114
Int. Cl. G01n 21/18
U.S. Cl. 356—199 13 Claims

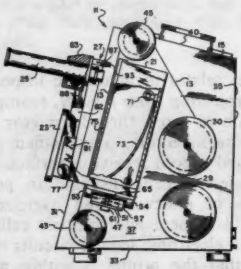
A device for measuring paper formation includes a light source projecting a luminous flux through the paper being measured, an optical objective system and an aperture stop upon the light-sensitive cathode of a photomultiplier tube. This tube produces a current which varies depending upon fluctuations in the transparency of the paper and which is amplified in a preamplifier. Another unit amplifies the alternating current component which is again amplified and rectified in a rectifying circuit. The direct current component is amplified depending on the formation of the paper. An instrument is used for checking the operation while an indicating device indicates paper formation. A slow control circuit is used for maintaining

the direct current component at constant magnitude; it includes a slow differential amplifier which is connected to the above-mentioned preamplifier and which controls



the high voltage pack. The high voltage pack is connected to the photomultiplier tube. Current is supplied to the various parts of the device by a stabilized voltage source.

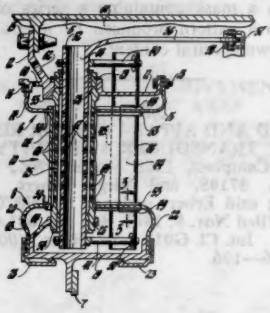
3,563,668
APPARATUS FOR INSPECTING MICROFILM
T. O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Eugene L. Klein, Cherry Hill, N.J.
Filed May 16, 1969, Ser. No. 825,259
Int. Cl. G01n *21/22*
U.S. Cl. 356—203 **8 Claims**



A microfilm inspection apparatus having reels for transporting microfilm over a light box and a rather large magnifying glass for viewing the film for general defects as its moves over the light box. The apparatus has a microscope adjacent the magnifying glass to obtain detail inspection of any particular frame of the film. Also, an electrical densitometer is pivotally mounted so as to swing into contact with the film and thereby obtain an accurate determination of the film density.

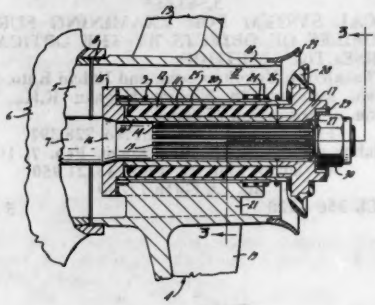
3,563,669
VARIABLE AREA NOZZLE
Chester E. Hockert and Earle R. Wall, Jr., Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed July 10, 1969, Ser. No. 840,625
Int. Cl. F01d *5/14, 25/02*
U.S. Cl. 415—115 **5 Claims**

A variable area turbine nozzle includes vanes having the major portion of the vane fixed to the nozzle shroud and having a trailing edge portion which may be reciprocated chordwise of each vane to vary the nozzle throat area. The trailing edge portions are moved by arms fixed on shafts which extend through the adjacent vanes, these shafts being coupled to a device for rotating them in unison. Provisions for cooling the interior of the fixed



portion of the vane and flowing the cooling air over the surface of the movable portion are included.

3,563,670
MARINE PROPELLER AND ITS MOUNTING
Carl Knuth, Fond du Lac, Wis., assignor to Brunswick Corporation, Chicago, Ill., a corporation of Delaware
Filed Jan. 31, 1969, Ser. No. 795,435
Int. Cl. B63h *21/26, 23/30*
U.S. Cl. 416—93 **21 Claims**

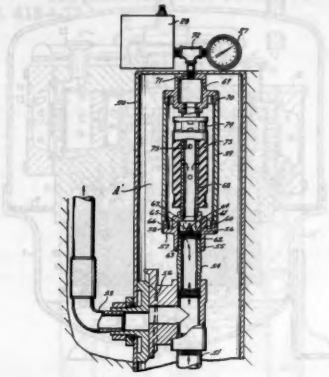


It is disclosed for an engine driven outboard propulsion unit having passage means for conducting the exhaust gases from the engine through said unit, a propeller separable from its slip clutch assembly mounting with provision in the propeller and/or its mounting for receiving the exhaust gases from the propulsion unit passage means and conducting such gases through the propeller hub for discharge rearwardly of the propeller at least during operation of the propulsion unit in the forward direction.

3,563,671
PUMP CONTROL
Anthony V. Weber, St. Louis County, Mo., assignor to Weber Industries, Inc., St. Louis, Mo., a corporation of Missouri
Filed Oct. 1, 1969, Ser. No. 862,711
Int. Cl. F04b *49/02, 49/06, 49/08*
U.S. Cl. 417—38 **9 Claims**

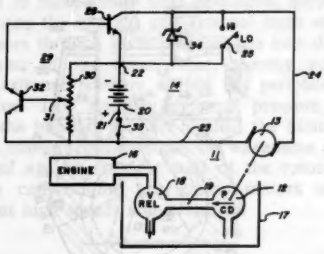
A pump control adapted for use within a pump system having an outlet pipe and with said control being

connected to said outlet pipe. Said control comprises an expansible pressure chamber in communication with said pump outlet pipe through a by-pass; there being a valve disposed across the normally direct flow path between said outlet pump and said pressure chamber and



being subjected to the pressure differential. A pressure switch as of the diaphragm type is presented for response to pressure within said pressure chamber and connected to said pump for de-energizing same upon the attainment of a predetermined pressure within said pressure chamber.

3,563,672
PUMP CONTROL SYSTEM
Walter T. Bergstrom, Chagrin Falls, Ohio, assignor to The Weldon Tool Company, a corporation of Ohio
Filed Jan. 14, 1969, Ser. No. 790,924
Int. Cl. F04b *49/06*
U.S. Cl. 417—45 **28 Claims**



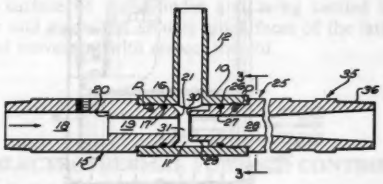
A fluid pump is driven by an electric motor and has an increasing fluid output with increasing motor and pump speed and the electric motor has increasing speed with increasing applied voltage. An electrical circuit is connected for driving and controlling the motor and is responsive to an increase in pressure on the outlet side of the pump to cause a decrease in motor applied voltage to thus reduce the motor speed and the fluid output of the pump. The foregoing abstract is merely a résumé of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,563,673
ULTRA HIGH VACUUM DIFFUSION PUMP FLUID AND METHOD OF USING SAME
Kohei Sakuma, Chiba-ken, and Hisashi Oikawa and Syuhei Tanimori, Tokyo, and Masayasu Takao, Chiba-ken, Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan, a corporation of Japan
No Drawing. Filed Dec. 12, 1968, Ser. No. 783,435
Claims priority, application Japan, Dec. 19, 1967, 42/81,309
Int. Cl. C07c *15/24*
U.S. Cl. 417—152 **5 Claims**

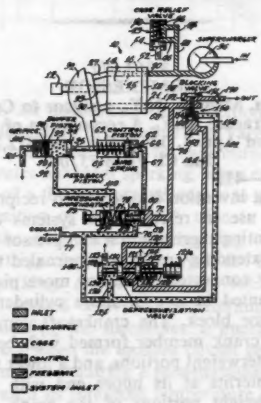
An ultra high vacuum diffusion pump fluid which serves to produce a desired degree of vacuum less than 10^{-9} torr, consists essentially of the condensation product of an olefin having twenty to twenty-four carbon atoms with naphthalene, methylnaphthalene or ethylnaphthalene.

3,563,674
ASPIRATING DEVICE
Donald L. Moffat, North Scituate, and Gardiner M. Williams, Warwick, R.I., assignors to General Signal Corporation, a corporation of New York
Filed July 16, 1968, Ser. No. 745,299
Int. Cl. F04f *5/00, 5/16, 5/44*
U.S. Cl. 417—196 **1 Claim**

An aspirating device comprising a nozzle and a throat portion with a suction chamber between, the throat portion being coaxial with the nozzle and of a greater diameter, the suction chamber being of a diameter greater than the throat portion wherein the relative diameters and lengths of the parts are significant.



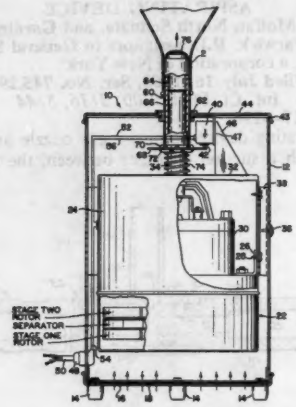
3,563,675
HYDRAULIC PUMP
Donald A. Straznickas, Rockford, Ill., assignor to Sundstrand Corporation, a corporation of Delaware
Filed Oct. 11, 1968, Ser. No. 766,879
Int. Cl. F04b *1/26, 23/12*
U.S. Cl. 417—222 **10 Claims**



A pressure compensated variable displacement pump for maintaining a substantially constant pump discharge

pressure with a depressurization valve for selectively effecting a reduction in pump discharge pressure by pressurizing the normally low pressure side of a pressure compensator valve constructed to normally maintain a predetermined high pump discharge pressure.

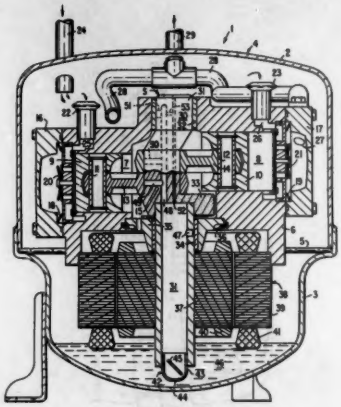
3,563,676
BALLOON INFLATER APPARATUS
Richard H. Coovert and Paul A. Seitz, Willard, Ohio, assignors to The Pioneer Rubber Company, Willard, Ohio
Filed Oct. 21, 1968, Ser. No. 769,023
Int. Cl. F04b *17/00, 35/04*
U.S. Cl. 417—410 **3 Claims**



The balloon inflater comprises a frame positioning an electrically powered air compressor therein adapted to discharge a stream of compressed air in a vertically upward direction. A discharge tube is movably connected to the discharge means and a control switch is operatively associated with the discharge means so that movement thereof can actuate the air compressor to provide an upwardly directed blast of compressed air when a balloon is engaged with the upper end of the discharge tube and it is moved for motor actuation purposes.

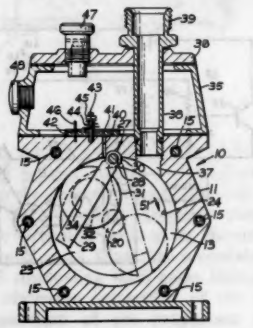
3,563,677
COMPRESSOR
Fred S. Retan, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y., a corporation of Delaware
Filed Apr. 1, 1969, Ser. No. 812,242
Int. Cl. F04b *35/04*
U.S. Cl. 417—415 **1 Claim**

The present invention is directed to reciprocating compressors for use in refrigeration systems comprising a housing mounting therewithin a compressor block having a vertically extending crankshaft journaled therein which is operatively connected to one or more pistons reciprocatingly mounted in one or more cylinders defined by the compressor block. The crankshaft comprises an integral upper crank member formed with bearing, eccentric and counterweight portions, and a lower tubular member which interfits at its upper end with the eccentric and counterweight portions of the crank member and supports generally intermediate the upper and lower ends the rotor of the motor mechanism. A crankshaft of this character has significant manufacturing and operational advantages since the tubular member utilizes a lesser amount of material without sacrifice in strength and



achieves improved oil pumping action, and the crank member, if produced by powder metallurgy, requires less machining and the balance properties are improved.

3,563,678
PUMPS
Peter Sadler, 3 Goodwood Court, Salford 6, Lancashire, England
Filed Mar. 24, 1969, Ser. No. 817,234
Claims priority, application Great Britain, Mar. 29, 1968, 15,187/68
Int. Cl. F04c *1/02, 11/00*
U.S. Cl. 418—6 **2 Claims**



A rotary piston pump, wherein a circular piston moves orbitally within a cylindrical pumping chamber within a stator with inlet and outlet ports being provided, one to each side of a pivoting vane cooperating with both the stator and the piston to form a partition in the pumping chamber, characterized in that the rotary piston is carried by a rotary end disc rotated by a main spindle and defining an end wall or part of an end wall of the pumping chamber.

3,563,679

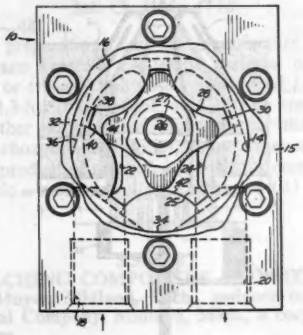
PRESSURE-COMPENSATED GEAR-ROTOR HYDRAULIC MOTOR OR PUMP

Eugene Richardson, Southfield, Mich., assignor to Lamina, Inc., Oak Park, Mich., a corporation of Michigan

Filed Jan. 9, 1969, Ser. No. 790,086

Int. Cl. F01c *1/10*; F04c *1/06*

U.S. Cl. 418—72 8 Claims



Rotatably mounted in a cylindrical rotor bore in a housing block containinf fluid inlet and outlet ports is an annular outer internal-gear-rotor containing an approximately star-shaped opeing having inwardly-projecting teeth or lobes separated from one another by truncated V-shaped recesses. Rotatably mounted within this star-shaped opening of the outer gear rotor is an inner external-gear rotor having outwardly-projecting teeth or lobes meshing snugly with the recesses between the teeth of the outer internal gear rotor. The inner rotor is mounted on a rotary shaft having its axis disposed eccentric to the axis of rotation of the outer rotor, and is provided with one less tooth or lobe than the outer rotor. Segmental circumferentially-spaced pockets are formed in the periphery of the outer rotor and are connetced by fluid passageways to the recesses between the internal teeth of the outer rotor. A portion of the pressure fluid developed, during operation, between the internal and external teeth of the two rotors passes through these passageways into the peripheral pockets of the outer rotor, thereby applying a standing external pressure against the periphery of the outer rotor. This standing external pressure counterbalances the internal pressure against the annular outer rotor and consequently prevents the expansion and binding thereof against the side wall of the rotor bore, as occurs in conventional gear rotor motors or pumps operated at high speeds and pressures.

3,563,680

ROTARY PISTON APPARATUS

Wilhelm Jehle, Blumberg-Zollhaus Baden, Germany, assignor to Karlheinz Bernhard Kindermann, Blumberg, Germany

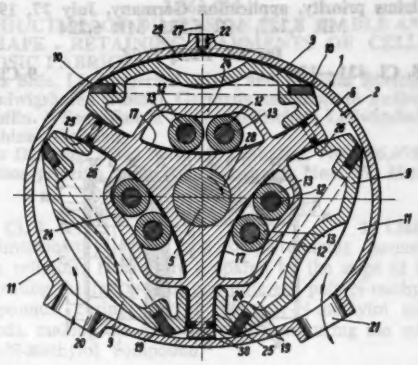
Filed Jan. 7, 1969, Ser. No. 789,563

Claims priority, application Germany, Jan. 8, 1968, P 16 01 817.0

Int. Cl. F03c *3/00*

U.S. Cl. 418—237 19 Claims

A rotary piston apparatus such as a motor, pump or compressor which includes a cylinder having an inner peripheral surface of oval cross section and rotary piston means centrally arranged in the cylinder and comprising a spider and a plurality of sealing members engaging the



inner surface of the cylinder and being carried by the spider and guided on arcuate guide faces of the latter for limited movement with respect thereto.

3,563,681

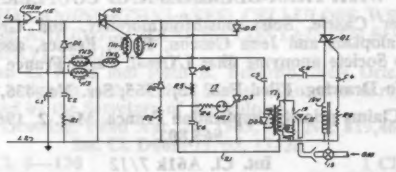
ELECTROTHERMAL FURNACE CONTROL

Hans G. Hirsbrunner, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware

Filed June 30, 1969, Ser. No. 837,823

Int. Cl. F23h *5/00*

U.S. Cl. 431—66 21 Claims



Apparatus for controlling the operation of a furnace having an electrically energizable fuel valve which, when energized, supplies fuel to the furnace burner. An ignition circuit generates recurrent sparking, when energized, upon the demand of a thermostat, and ceases to generate sparking after ignition of the fuel. A triac is connected for energizing the fuel valve. A triggering circuit for the triac causes triggering thereof only if the ignition circuit generates sparking. A thermistor prevents triggering of the triac if heated above a predetermined threshold. Means for heating the thermistor is energized to cause heating thereof when the ignition circuit generates sparking, the thermistor requiring a predetermined heating time interval to reach its threshold temperature causing termination of triggering of the triac if the fuel is not ignited within this interval.

3,563,682

PRESSURE-ACTUATED LIGHTER

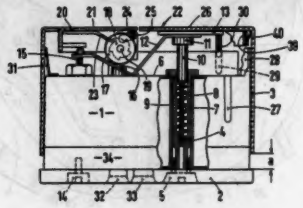
Helmut Bross, Biberttalstrasse 24, Altenberg, near Nuremberg, Germany

Filed Jan. 22, 1969, Ser. No. 793,067

Claims priority, application Germany, July 27, 1968, MR 6,222, MR 6,223, MR 6,224

Int. Cl. F23q 1/04

U.S. Cl. 431—130 9 Claims



A pressure-actuated pocket lighter which comprises a housing having two parts movable toward each other to operate the lighter, and having an upper surface which is divided into at least two sections which together form a substantially smooth, continuous surface when the lighter is not actuated, and in which one of these sections forms the actuating surface of one housing part which is adapted to be depressed to operate the lighter, while the other sections forms the upper surface of an element which, when the actuating surface is depressed, either remains in a fixed position or moves in a direction substantially opposite to the depressing movement.

3,563,683

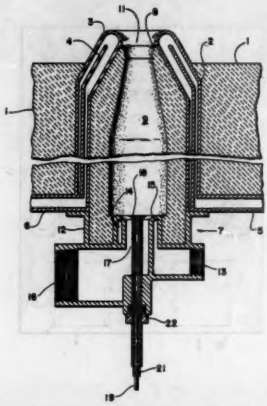
INDUSTRIAL BURNER

Frederic O. Hess, Skytop, Pa., assignor to Selas Corporation of America, a corporation of Pennsylvania

Filed Apr. 3, 1969, Ser. No. 813,221

Int. Cl. F23d 11/36

U.S. Cl. 431—160 4 Claims



A submerged combustion type burner that is located in a furnace wall below the level of the material being heated. Provision is made to remove the burner without losing material through the opening from which it was removed.

CHEMICAL

3,563,684

DYEING KERATINIC FIBERS AND HUMAN HAIR WITH PARA-DIAMINES AND COUPLERS

Roger Charle, Soisy-sous-Montmorency, and Grégoire Kalopissis and Jean Gascon, Paris, France, assignors to Societe anonyme dite: L'Oreal, Paris, France

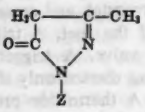
No Drawing. Filed Feb. 25, 1965, Ser. No. 435,346

Claims priority, application France, Mar. 2, 1964, 965,802

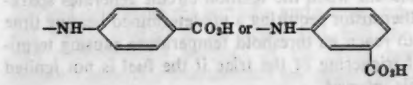
Int. Cl. A61k 7/12

U.S. Cl. 8—11 7 Claims

The invention relates to dyeing keratinic fibers with a 1-amino-4-amino-benzene which can have halogen, alkyl or alkoxy groups on the benzene ring and a coupler selected from the group consisting of substituted phenols, $R_3CO—CH_2—COR_4$ and



in which R_3 and R_4 are both $—CH_3$, R_3 is $—CH_3$ and R_4 is $—OC_2H_5$ and R_3 is phenyl and R_4 is



and Z is a sulphophenyl or chloro-sulphophenyl.

3,563,685

DYEING POLYAMIDE FIBERS WITH A YELLOW MONAZO ACID DYE

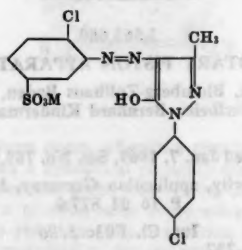
Stanley B. Speck, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed Apr. 27, 1967, Ser. No. 634,110

Int. Cl. D06p 1/02, 1/86

U.S. Cl. 8—41 2 Claims

Dyeing polyamide fibers with a dyebath containing disodium dodecyldiphenylether disulfonate and the yellow acid dye of the following structure



where M is H, ammonium radical or alkali metal.

3,563,686

DYEING PREPARATIONS FOR THE MANUFACTURE OF WATER-INSOLUBLE AZO DYESTUFFS ON TEXTILE MATERIAL OF AROMATIC POLYESTERS OF TRIACETYL CELLULOSE

Helmut Arm and Helmut Beutler, Langen, Hasso Hertel Offenbach am Main, and Rudolf Lowenfeld, Buchschlag, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany, a corporation of Germany

No Drawing. Filed May 10, 1968, Ser. No. 728,345
Claims priority, application Germany, May 13, 1967, F 52,405
Int. Cl. D06p *1/18*
U.S. Cl. 8—44 6 Claims

Dyeing preparations for the manufacture of water-insoluble azo dyestuffs on textile material of aromatic polyesters or triacetyl cellulose consisting of (a) an arylamide of 2,3-hydroxynaphtoic acid, (b) an aminobenzene which further contains substituents other than sulfonic acid or carboxylic acid groups, (c) a water-soluble condensation product of an aromatic hydroxy compound and an aromatic ω-methane-sulfonic acid, and (d) water.

3,563,687

BLEACHING COMPOUNDS AND METHOD

John R. Moyer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Filed Mar. 12, 1968, Ser. No. 712,475
Int. Cl. D06l *3/02*
U.S. Cl. 8—111 2 Claims

In oxidizing and bleaching solutions containing organic monoperacids and/or salts thereof, the improvement which comprises providing a pH of at least about 9.0 in said bleaching solution thereby to substantially prevent the fading of color dyes in textile materials. In dry solid bleaching compositions containing at least one peroxygen compound and at least one organic acid anhydride and which when dissolved in an aqueous solution, yields an organic monoperacid and/or salt thereof as a bleaching and oxidizing agent, the improvement which comprises: including in said composition a sufficient quantity of a solid base compound to provide a pH of at least about 9.0 in said aqueous solution to assure a color-safe bleaching solution.

3,563,688

PROCESS FOR ADDING LEAD TO COTTON BY USE OF REACTION BETWEEN DEAE CELLULOSE AND ALKALINE SOLUTION OF SODIUM PLUMBITE

Truman L. Ward and Ruth R. Benerito, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed May 27, 1969, Ser. No. 828,331
Int. Cl. D06m *1/00*
U.S. Cl. 8—116 2 Claims

This invention relates to a process for adding lead to cellulosic fabric by reacting diethylaminoethyl (DEAE) cellulose with an alkaline solution of sodium plumbite.

3,563,689

PROCESS USEFUL TO PRODUCE A FABRIC THAT EXHIBITS IMPROVED FIRE RETARDANT PROPERTIES UTILIZING HALOGENATED OXIRANE AND THIIRANE REACTANTS

Truman L. Ward and Ruth R. Benerito, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed May 1, 1969, Ser. No. 821,118
Int. Cl. D06m *13/08, 13/28, 13/40*
U.S. Cl. 8—116.2 4 Claims

A process for increasing the flame resistance of cellulose by adding halogens thereto which comprises treating diethylaminoethyl cellulose with a halogenated oxirane in the presence of thiourea or with a halogenated thiirane in the presence of an alcohol.

3,563,690

PRODUCTION OF DIMENSIONALLY STABLE AND SHAPE - RETAINING GARMENTS OF CELLULOSIC FABRICS

Heinz Bille, Limburgerhof, Pfalz, and Wilhelm Ruettiger, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Nov. 22, 1966, Ser. No. 596,078
Claims priority, application Germany, Nov. 27, 1965, B 84,745
Int. Cl. D06m *13/12, 13/34*
U.S. Cl. 8—116.3 13 Claims

Dimensionally stable and shape-retaining garments from cellulosic fabrics are prepared by the steps of impregnating the fabric with two different poly-N-methylol compounds, curing one of the poly-N-methylol compounds, making the garment, and then curing the other poly-N-methylol compound.

3,563,691

PROCESS FOR PRODUCING A DEAE CELLULOSIC FABRIC WHICH INCORPORATES REVERSIBLE CROSS-LINKS

Truman L. Ward and Ruth R. Benerito, New Orleans, and Donald M. Soignet, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,440
Int. Cl. D06m *13/08, 13/28*
U.S. Cl. 8—120 4 Claims

Fabrics composed of diethylaminoethylated cellulosic fibers are reacted with halogenated epithiopropanes. The modified fabrics may be cross-linked by treatment with an oxidizing agent. The cross-linkages may be broken by treating the fabric with a reducing agent.

3,563,692

DIETHYLAMINOETHYLATED CELLULOSE WEAK BASE ANION EXCHANGER CONTAINING SULFHYDRYL GROUPS

Truman L. Ward and Ruth R. Benerito, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,468
Int. Cl. D06m *13/08, 13/28*
U.S. Cl. 8—120 1 Claim

This invention relates to the production of partial cellulose ethers containing sulfhydryl groups and with weak base anion exchange properties through reaction of diethylaminoethylated cellulose with chlorinated thiirane compounds in the presence of certain alcohols.

3,563,693

DRY PROCESS FOR CLEANING GARMENTS

Herman Cohen, Forest Hills, N.Y., assignor to Softex Processing Corporation, New York, N.Y., a corporation of New York

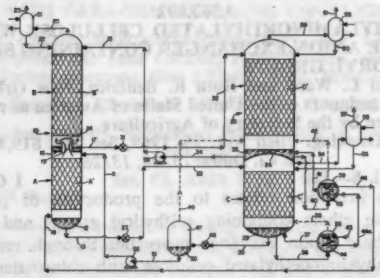
No Drawing. Continuation of application Ser. No. 438,392, Mar. 9, 1965. This application Nov. 5, 1969, Ser. No. 871,525
Int. Cl. D06l *1/00*
U.S. Cl. 8—142 9 Claims

Furs are cleaned by contacting the fur with an organic dry cleaning liquid mixed with ground pith of corn stalks.

3,563,694
DEPILATORY COMPOSITION AND PROCESS FOR MAKING
Abraham Minton, Rego Park, N.Y., assignor to Marie Ganee Ltd., New York, N.Y., a corporation of Delaware
No Drawing. Filed Dec. 7, 1967, Ser. No. 688,658
Int. Cl. A61k *7/00, 7/14*
U.S. Cl. 8—160 **2 Claims**

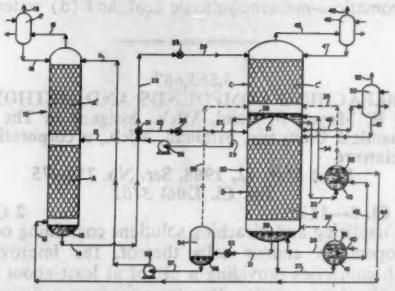
A depilatory cream is provided which is used at room temperature by spreading the same over the surface from which the hair is to be removed, pressing a cloth into the layer, and then stripping the cloth away. The depilatory composition is comprised of a water soluble or emulsifiable solvent which is fluid at room temperature and which comprises at least one of the following materials: (1) a polyol which is tribasic or higher, i.e. a polyhydric alcohol having at least three replaceable hydrogen atoms, (2) a derivative of such a tribasic or higher polyol or (3) a polymer of up to 10 monomeric units of such a tribasic or higher polyol. There is dissolved in the solvent an effective amount of a solute comprising a water-soluble or emulsifiable carbohydrate which is soluble in the solvent when hot and which substantially remains in solution when cold. The cream can be prepared by dissolving the solute in the hot solvent and maintaining the solution hot until the viscosity of the solution is established at a desired level. This can be controlled by the water content of the solution. A preferred example of the depilatory cream is a composition comprising glycerol having about 40–50% by weight of a cold water-soluble dextrin dissolved therein and containing about 4½–5% by weight of water.

3,563,695
SEPARATION OF CO_2 AND H_2S FROM GAS MIXTURES
Homer E. Benson, Pittsburgh, Pa., assignor to Benson, Field and Epes, a copartnership
Continuation-in-part of application Ser. No. 715,412, Mar. 22, 1968. This application Mar. 4, 1969, Ser. No. 804,247
Int. Cl. B01d *47/00*
U.S. Cl. 23—2 **30 Claims**



A process of improved thermal efficiency and lower capital cost for separating the acid gases CO_2 and/or H_2S from gas mixtures which is applicable when the partial pressure of acid gas is at least 25 pounds per square inch. Two separate absorption zones are used, supplied with separate streams of solution and operating at different temperatures. The gas flows in series through the separate absorption zones with solution leaving the higher temperature zone at a temperature higher than the atmospheric boiling temperature of the regenerated solution. Two separate regeneration zones are used operating at different temperatures (and correspondingly different pressures) with solution from the higher temperature absorption zone regenerated in the higher temperature, higher pressure regeneration zone. Stripping steam for the lower temperature regeneration zone is generated by reducing the pressure on the hot regenerated solution from the higher temperature regeneration zone. The process permits the effective utilization of the heat content of hot feed gases and the heat of absorption of the acid gases, which heat sources have been in previous practice largely wasted.

3,563,696
SEPARATION OF CO_2 AND H_2S FROM GAS MIXTURES
Homer E. Benson, Pittsburgh, Pa., assignor to Benson, Field and Epes, a copartnership
Continuation-in-part of application Ser. No. 804,247, Mar. 4, 1969. This application June 17, 1969, Ser. No. 834,066
Int. Cl. B01d *47/00*
U.S. Cl. 23—2 **23 Claims**

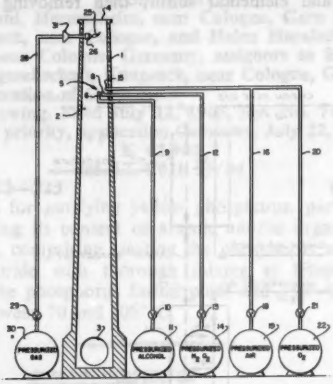


A process of improved thermal efficiency and lower capital cost for separating CO_2 and/or H_2S from gas mixtures using a regenerable aqueous alkaline scrubbing solution which is circulated in a cyclic process between absorption and regeneration stages. In the absorption stage, at least a portion of the solution reaches a temperature above the atmospheric boiling temperature of the regenerated solution. In the regeneration stage at least two separate regeneration zones are used operating at different temperatures and correspondingly different pressures. The higher temperature, higher pressure regeneration zone is supplied with solution from the absorption stage which is at a temperature above the atmospheric boiling temperature of the regenerated solution, while the lower temperature, lower pressure regeneration zone is supplied with a separate stream of solution. Stripping steam for the lower temperature regeneration zone is generated by reducing the pressure on the hot regenerated solution from the higher temperature regeneration zone. The process permits the effective utilization of the heat content of hot feed gases and the heat of absorption of the acid gases, which heat sources have been in previous practice largely wasted.

3,563,697
SMOKE ABATEMENT PROCESS
Raul F. de Castro, Olean, N.Y., assignor to R. F. de Castro Interprises, Inc., Olean, N.Y., a corporation of New York
Continuation-in-part of application Ser. No. 558,018, June 16, 1966. This application Oct. 13, 1969, Ser. No. 865,555
Int. Cl. B01d *53/34*
U.S. Cl. 23—2 **9 Claims**

A process of eliminating noxious elements from a confined stream of smoke before being discharged from an outlet into the atmosphere, includes injecting an oxidizing agent and a monohydric alcohol containing not more than

four carbon atoms into the confined stream to insure mixture of the noxious elements with the oxidizing agent and



alcohol, and igniting such mixture to consume the noxious elements.

3,563,698

PROCESS FOR PREPARING ZINC CYANIDE

John Derek Rushmere, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed Mar. 14, 1969, Ser. No. 807,403
Int. Cl. C01c *3/08*
U.S. Cl. 23—79 9 Claims

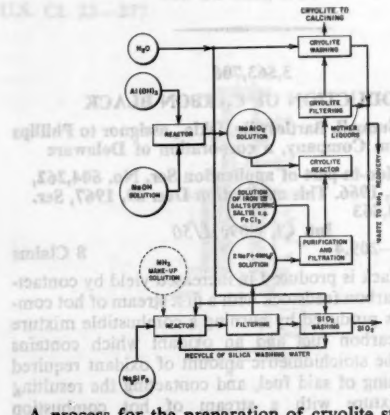
An aqueous slurry process for the manufacture of zinc cyanide by the reaction of zinc oxide and hydrogen cyanide is provided. The conversion of zinc oxide to zinc cyanide is improved by the presence of an acid having a pK between 2.5 and 7.5 such as acetic acid in an amount such that the equivalent ratio of acid to zinc oxide is less than about 0.3 to 1.

3,563,699

PROCESS FOR THE PREPARATION OF VERY PURE CRYOLITE FROM SODIUM FLUOSILICATE AND AMMONIA

Giovanni Cuneo and Pietro Saccardo, Milan, and Giuseppe Muratori, Villanova di Bagnacavallo, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy, a corporation of Italy

Filed May 28, 1969, Ser. No. 828,570
Int. Cl. C01c *1/02*; C01f *7/54*
U.S. Cl. 23—88 7 Claims



A process for the preparation of cryolite starting from sodium fluosilicate is disclosed which involves the steps of:

(a) reaction, at temperature between 35° C. and 80° C., of sodium fluosilicate with a dilute aqueous solution of ammonia, said ammonia being in excess of 20–30% by weight on the stoichiometric quantities necessary to satisfy the reaction:

$$Na_2SiF_6+4NH_4OH \rightarrow 2NaF+4NH_4F+SiO_2+2H_2O$$

so that the final pH is between 7.9 and 9.2; thus obtaining an aqueous solution of sodium and ammonium fluorides and a precipitate of silica.

(b) separation of silica.

(c) treatment of the solution of sodium and ammonium fluorides with a ferric salt in excess with respect to the silica and phosphate ion still contained in the solution, and separating the precipitated impurities.

(d) incomplete precipitation of the cryolite obtainable from the above solution by adding sodium metaaluminate in an amount less than the stoichiometric quantity necessary to precipitate all the cryolite, so that a substantial quantity of fluoride ion remains in the solution.

(e) recycling of all or part of the mother liquor of the cryolite for reaction with sodium fluosilicate.

3,563,700

PROCESS FOR MAKING SATIN WHITE

Morrison N. Stiles, Charlotte, N.C., and George M. Simpson, Rock Hill, S.C., assignors to Bowaters Carolina Corporation, Catawba, S.C., a corporation of Delaware

No Drawing. Filed Apr. 25, 1968, Ser. No. 724,262
Int. Cl. C09c *1/02*; C01f *7/02*
U.S. Cl. 23—52 11 Claims

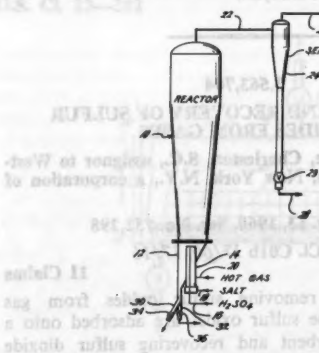
A process of preparing a satin white pigment by reacting an alum solution with a high purity hydrated lime slurry. The alum solution is added to the lime slurry while rapidly agitating the reaction mixture. The total amount of water present in the reaction mixture is regulated to control both the initial amount of lime which is solubilized and the amount of satin white solids present in the reaction mixture upon completion of the reaction. The temperature is regulated throughout the reaction, the alum is added at a controlled rate, and the reaction is terminated when the pH of the reaction mixture is between about 12.3 and 9.5. Starch may be added upon completion of the reaction and the resultant mixture may be dewatered to a relatively high solids content. The resultant mass, upon application of shear, breaks down to a free flowing, pumpable liquid.

3,563,701

METHOD OF PRODUCING SULFATE GRANULES AND VOLATILE ACID GASES

Curtis W. Cannon, Boulder, Colo., assignor to Climax Chemical Company, Monument, N. Mex., a corporation of Delaware

Filed Feb. 28, 1967, Ser. No. 619,434
Int. Cl. C01d *5/02*; C01g *1/10*
U.S. Cl. 23—117 15 Claims



A method of and apparatus for producing sulfate salts and a volatile acid gas by providing intimate contact be-

tween fluidized salt particles and a spray of sulfuric acid in a reaction zone maintained at elevated temperature.

This abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,563,702

PRODUCTION OF CHLORINE DIOXIDE

Harold de Vere Partridge, Wilson, Blaine O. Schoepfle, Snyder, Arthur C. Schulz, North Tonawanda, and Herbert J. Rosen, Yonkers, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y., a corporation of New York

No Drawing. Filed Mar. 5, 1968, Ser. No. 710,648

Int. Cl. C01d *5/02;* **C01b** *11/02, 7/02*

U.S. Cl. 23—121 **8 Claims**

There is provided an improved process for the production of chlorine dioxide and chlorine wherein an alkali metal chlorate, chloride, and a strong acid are reacted in a single vessel in the presence of a relatively small amount of a catalyst selected from the group consisting of vanadium pentoxide, silver ions, manganese ions, dichromate ions, and arsenic ions.

This process, especially one of the preferred embodiments thereof wherein the acidity of the reaction mixture is maintained at below about 4 normal, is superior to and more efficient than prior art processes.

3,563,703

PROCESS FOR TREATING PHOSPHATE ROCK

Ernest C. Camp, Jr., College Park, Ga., assignor to Cities Service Company, New York, N.Y., a corporation of Delaware

No Drawing. Filed Apr. 29, 1968, Ser. No. 725,139

Int. Cl. C01b *25/22;* **C01f** *11/38*

U.S. Cl. 23—165 **11 Claims**

This is an improved process for producing phosphoric acid from natural phosphate rock by acidulating the rock with from about 75 to 85% by weight nitric acid, and thereafter precipitating anhydrous calcium nitrate from the acidulate. In general, the anhydrous calcium nitrate is precipitated by increasing the content of nitric acid in the acidulate. When employing this two-step process, a phosphoric acid solution is obtained which is easily separated from the anhydrous calcium nitrate, and is readily converted to a highly water soluble mixer fertilizer having a high plant food analysis.

3,563,704

REMOVAL AND RECOVERY OF SULFUR OXIDES FROM GASES

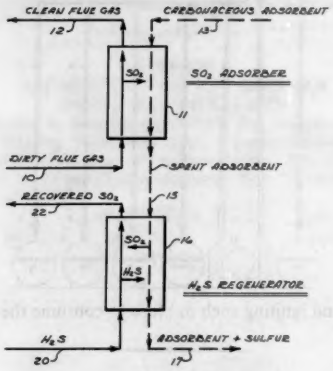
Samuel L. Torrence, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y., a corporation of Delaware

Filed Aug. 13, 1968, Ser. No. 752,298

Int. Cl. C01b *17/60, 17/16*

U.S. Cl. 23—178 **11 Claims**

A process for removing sulfur oxides from gas streams whereby the sulfur oxides are adsorbed onto a carbonaceous adsorbent and recovering sulfur dioxide from the spent adsorbent by contacting the adsorbent with an oxide-reducing gas, i.e., hydrogen sulfide, whereby the adsorbed sulfur oxides having been adsorbed as sulfuric acid and sulfur trioxide are reduced to sulfur dioxide and elemental sulfur, then removing the elemental sulfur from the adsorbent by contacting with a sulfur-reducing gas and thereafter recycling the adsorbent.



3,563,705

METHOD OF INHIBITING PUFFING IN THE MANUFACTURE OF GRAPHITE BODIES

Lloyd I. Grindstaff, Elizabethton, Mack P. Whittaker, Johnson City, and Michael F. Baud, Elizabethton, Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed Mar. 17, 1969, Ser. No. 807,963

Int. Cl. C01b *31/04*

U.S. Cl. 23—209.1 **4 Claims**

The irreversible expansion of graphitic materials at temperatures of up to 2900° C., which is due to the evolution of sulfur from the carbon aggregate used as starting material, is eliminated by incorporation of as little as 0.05 part by weight of a titanium or zirconium compound per 100 parts of carbon aggregate, e.g. TiO_2, in conjunction with the conventional "puffing" inhibitors of the art.

3,563,706

PRODUCTION OF CARBON BLACK

Thomas J. Gunnell, Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware

Continuation-in-part of application Ser. No. 604,262, Dec. 23, 1966. This application Dec. 29, 1967, Ser. No. 694,563

Int. Cl. C09c *1/50*

U.S. Cl. 23—209.4 **8 Claims**

Carbon black is produced in increased yield by contacting a hydrocarbon feedstock with a first stream of hot combustion gases produced by burning a combustible mixture of a hydrocarbon fuel and an oxidant which contains more than the stoichiometric amount of oxidant required for the burning of said fuel, and contacting the resulting reaction mixture with a stream of hot combustion gases produced by burning a combustible mixture of a hydrocarbon fuel and an oxidant which contains less than the stoichiometric amount of oxidant required for the burning of said fuel. Apparatus is also disclosed.

3,563,707
PROCESS FOR PURIFYING YELLOW PHOSPHORUS

Fritz Krahl, Hermulheim, near Cologne, Gero Heymer, Knapsack, near Cologne, and Heinz Harnisch, Lovenich, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany, a corporation of Germany

No Drawing. Filed July 12, 1968, Ser. No. 744,318
Claims priority, application Germany, July 22, 1967, K 62,908
Int. Cl. C01b *25/04*
U.S. Cl. 23—223 8 Claims

Process for purifying yellow phosphorus, particularly for reducing its content of arsenic and/or organic contaminants, comprising treating the phosphorus with sulfuryl chloride with thorough mixing at temperatures between the phosphorus fusion point and 150° C., preferably between 70 and 100° C.

3,563,708
PROCESS FOR THE ASSAY OF 3-CARBALKOXY-4-HYDROXYQUINOLINES

Loyal R. Stone and William H. Ray, Ashland, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y., a corporation of Delaware

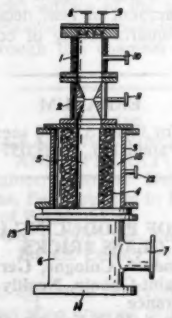
No Drawing. Filed May 29, 1968, Ser. No. 732,882
Int. Cl. G01n *21/52, 21/02, 31/08*
U.S. Cl. 23—230 10 Claims

The use of lower aliphatic alcohols containing cations of the alkaline earth metal group in the extraction of 3-carbalkoxy-4-hydroxyquinolines from animal feeds and tissues improves the extractability thereof, increases the intensity of the fluorescence when such solutions are subjected to an activating light, and increases the spread between the wavelength of the activating light and the fluorescent response thus making it possible to greatly simplify the photofluorometric assay procedure.

3,563,709
APPARATUS FOR PYROLYZING HYDROCARBONS

Miloslav Staud and Anatolij Lazarev, Brno, Czechoslovakia, assignors to Chepos, Zavody Chemickeho a Potravinarskeho Strojirenstvi, Oborovy Podnik, Brno, Czechoslovakia

Continuation-in-part of application Ser. No. 674,570, Oct. 11, 1967. This application Sept. 17, 1968, Ser. No. 760,240
Claims priority, application Czechoslovakia, Oct. 14, 1966, 6,535/66
Int. Cl. C10g *9/36*
U.S. Cl. 23—277 4 Claims

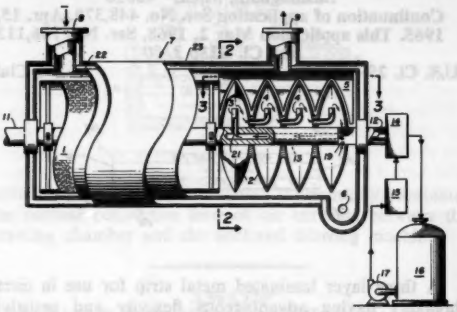


A hydrocarbon raw material is pyrolyzed to lower unsaturated aliphatic hydrocarbons by mixing the raw material with hot combustion gases at a rate sufficient to heat the mixture above the pyrolyzing temperature. The endothermic reaction is performed in a porous tube while oxygen is being forced into the tube through the wall to supply the thermal energy consumed and to maintain the pyrolysis temperature by oxidation of a portion of the pyrolysis product, particularly hydrogen. The reaction mixture is then quickly cooled.

3,563,710
POLYMERIZATION APPARATUS

William F. Dew, Jr., and Allen E. Leybourne III, Decatur, Ala., and Robert E. Colwell, Chapel Hill, N.C., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

Filed Feb. 16, 1968, Ser. No. 705,965
Int. Cl. F28d *11/08*
U.S. Cl. 23—285 19 Claims

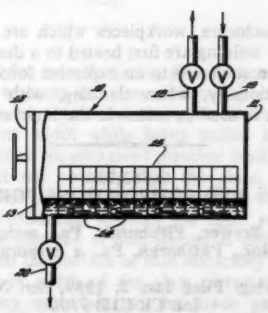


A continuous polymerization apparatus specifically constructed to provide for controlled temperature, uniform mixing, and excellent surface generation and film formation, having juxtaposed rotor and stator surfaces with a circulating heat transfer medium therein, thereby providing, in conjunction with heat transfer medium temperature control, means to mix the polymer and to provide finite temperature control of the juxtaposed surfaces as well as means to forward the polymer toward the exit end of the reaction chamber; thereby to produce extremely high viscosity high molecular weight polymers.

3,563,711
PROCESS FOR REMOVAL OF SILICEOUS CORES FROM CASTINGS

Charles M. Hammond, Alliance, Ronald D. Markle, Minerva, and Robert E. McCracken, Louisville, Ohio, assignors to TRW Inc., Cleveland, Ohio, a corporation of Ohio

Filed July 18, 1968, Ser. No. 745,769
Int. Cl. B01d *11/02*; G01b *33/32*
U.S. Cl. 23—312 9 Claims



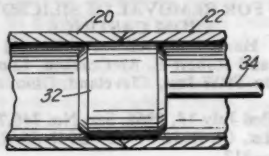
Process for the removal of a siliceous core from a metal casting which involves placing the casting in a

closed vessel, introducing an aqueous caustic alkali solution into the vessel capable of dissolving the core, heating the alkali solution to a temperature for maximum rate of removal but not high enough to attack the casting, thereafter reducing the pressure to induce boiling of the solvent material trapped in the passages in which the core has been partially dissolved by the solution, and repressurizing the vessel, and then repeating the steps of reducing and increasing the ambient pressure until the core is completely dissolved from the casting, the induced boiling and recondensation serving to remove and replace spent leaching solution in the small cored passages.

3,563,712
LAMINATED THERMOSTATIC METAL
Charles F. Zeigler, 4960 Broomfield Lane, Birmingham, Mich. 48010
Continuation of application Ser. No. 448,370, Apr. 15, 1965. This application May 2, 1968, Ser. No. 726,113
Int. Cl. B23p *3/00*
U.S. Cl. 29—195.5 **1 Claim**

A three layer laminated metal strip for use in circuit breakers having advantageous flexivity and resistivity characteristics and formed from a high expanding metal lamination, a low expanding metal lamination and an additional lamination disposed between the low expanding and high expanding laminations.

3,563,713
EXPLOSIVE WELDING
Wallace C. Rudd, Larchmont, N.Y., assignor to AMF Incorporated, New York, N.Y., a corporation of New Jersey
Filed Feb. 29, 1968, Ser. No. 709,464
Int. Cl. B23k *1/20, 31/02*
U.S. Cl. 29—488 **15 Claims**



In this disclosure, workpieces which are to be joined by explosive welding are first heated to a desired temperature and then subjected to an explosive force to make the weld. Additionally, when cladding, with an explosive force, a flux is used to maintain the interface spacing.

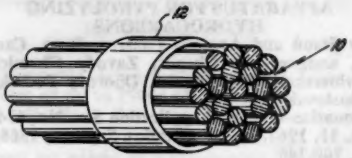
3,563,714
METHODS AND COMPOSITIONS FOR PACKING COAL
Arthur G. Brewer, Pittsburgh, Pa., assignor to Fluid Density, Inc., Pittsburgh, Pa., a corporation of Pennsylvania
No Drawing. Filed Jan. 2, 1969, Ser. No. 788,646
Int. Cl. C10l *9/00*
U.S. Cl. 44—6 **5 Claims**

A method and composition are provided for treating coal to improve its packed bulk density by mixing light fuel oil distillate, water and sufficient surfactant to emulsify the oil and water, treating the coal with the mixture and packing the treated coal into a desired vessel.

3,563,715
MOTOR FUELS
Wallace L. Richardson, Lafayette, William T. Stewart, El Cerrito, and Maurice R. Barusch, Richmond, Calif., assignors to Chevron Research Company, a corporation of Delaware
No Drawing. Filed July 15, 1958, Ser. No. 748,624
Int. Cl. C10l *1/18*
U.S. Cl. 44—66 **23 Claims**

1. A knock-resistant leaded gasoline composition for use in spark ignition engines, said composition comprising (1) gasoline containing paraffinic hydrocarbon content of not more than 95% by volume and a minimum Research octane number of about 90; (2) a lead akyl antiknock additive in an amount from about 0.5 to about 6.0 cc. per gallon of said gasoline; and (3) a small amount, sufficient to extend the antiknock effect of lead in said gasoline, of a gasoline-dispersible, non-corrosive tertiary alcohol ester of a monocarboxylic acid containing only carbon, hydrogen and oxygen in its molecular structure, said ester being inert with respect to lead alkyls at temperatures up to about 40° C., being present in said leaded gasoline in a concentration from about 3 to about 60 moles per gram-atom of lead in the gasoline.

3,563,716
POTTING QUARTZ GLASS FIBER BUNDLE ENDS
Pei Ching Li, Northbrook, Ill., assignor to the United States of America as represented by the Secretary of the Air Force
Filed May 17, 1968, Ser. No. 730,109
Int. Cl. C03c *11/08, 23/20*
U.S. Cl. 65—4 **2 Claims**



The apparatus and method to accomplish fusion of the ends of a bundle of glass fibers by first enclosing the fiber bundle ends within a short length of glass tubing, and then applying the amount of heat necessary to integrate the fibers and the quartz tubing or collar into a single mass.

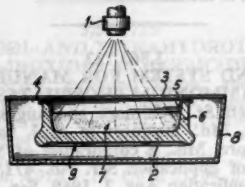
ERRATUM

For Class 65—30 see:
Patent No. 3,563,057

3,563,717
METHOD OF PRODUCING HOLLOW GLASS BRICKS
Heinz Bertram, Sindorf, Cologne, Germany, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France, a company of France
Filed Jan. 8, 1968, Ser. No. 696,267
Int. Cl. C03b *23/24*
U.S. Cl. 65—58 **12 Claims**

A method for producing hollow glass bricks with an enamel coating. The method comprises the application of the enamel to the inner surface of half bricks while

they are maintained at room temperature, heating of the half bricks to above their upper glass transformation temperature but below their liquifying temperature while the



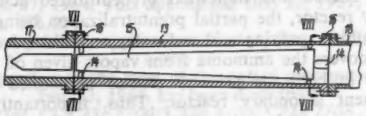
half bricks are resting on one of their narrow sides, and then welding the two half bricks together along edges to form a colored transparent whole glass brick.

3,563,718

METHOD OF SURFACE TREATMENT OF GLASS PRODUCTS

Adomas Bolyaus Paplauskas, Strelbischensky pereulok 27, kv. 12; Vadim Alexandrovich Ryabov, Pushkinskaya ulitsa 7/5, kv. 37; Nikolai Ivanovich Semenov, Ulitsa Panferova 8, kv. 141; Vladimir Vasilievich Anisimov, Ulitsa Donskaya 28/32, kv. 120; Alexandr Kazimirovich Katarzhis, Astrodamskaya ulitsa 4, vl. 16; Vsevolod Vasilievich Polyakov, Vorontsovskaya ulitsa 27/35, kv. 62; and Antonina Ivanovna Samokhvalova, Nizhegordskaya ulitsa 11b, kv. 50, all of Moscow, U.S.S.R.

Filed May 7, 1969, Ser. No. 822,406
Int. Cl. C03b *27/00*
U.S. Cl. 65—61 **6 Claims**



A method of surface treatment of glass products adapted for producing high-strength glass articles with a transparent or light-diffusing surface by the use of simple techniques and readily available cheap equipment by placing the glass articles into a chamber with a clearance between the treated surface of the article and the inside surface of the chamber and passing a water or steam-water stream through this chamber for 5 minutes past the article.

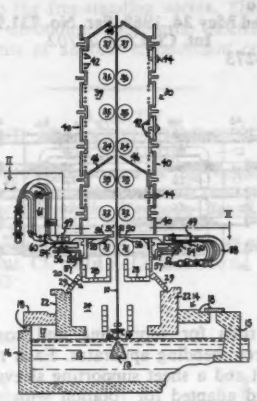
3,563,719

SHEET GLASS DRAWING METHOD AND APPARATUS

George E. Sleighter, Natrona Heights, and Roy W. Yunker, Verona, Pa., assignors to PPG Industries, Inc., a corporation of Pennsylvania

Filed Oct. 2, 1967, Ser. No. 672,378
Int. Cl. C03b *15/12*
U.S. Cl. 65—95 **9 Claims**

Method of and apparatus for pressurizing the drawing chamber in a sheet glass drawing process and controlling the temperature of a sheet of glass being drawn from the chamber through an enclosed drawing machine. Plenum chambers are positioned above the drawing chamber to discharge a substantially continuous, uniform flow of gaseous fluid at a controlled temperature toward each surface and across the full width of the sheet of glass. The gaseous fluid increases the pressure of the drawing chamber, controls the temperature of the glass sheet, and



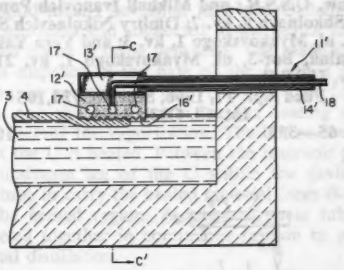
provides a gaseous barrier which substantially eliminates the natural convective flow of air currents between the drawing chamber and the enclosed drawing machine.

3,563,720

APPARATUS FOR MANUFACTURING A FLOAT GLASS RIBBON OF LESS THAN EQUILIBRIUM THICKNESS

Kunihiko Ito and Yukiya Fujimoto, Maizuru-shi, Japan, assignors to Nippon Sheet Glass Co., Ltd.

Filed Jan. 3, 1968, Ser. No. 695,399
Claims priority, application Japan, Jan. 10, 1967, 42/2,060
Int. Cl. C03b *18/00*
U.S. Cl. 65—182 **2 Claims**



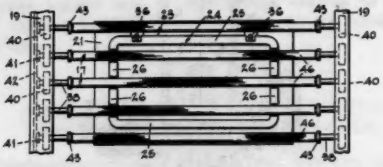
Apparatus for manufacturing glass ribbon on a molten metal bath, wherein the glass ribbon is pressed down at the both side edge portions where the ribbon tends to be reduced in its width while being pulled longitudinally with a surface of an elongated member made of a refractory material not wettable with the glass, said surface having grooves substantially extending in a direction of the glass advancement, whereby the upper surface of the pressed edge portions of the ribbon is deformed along the grooves on the surface of said refractory material and the decrease in width of the glass ribbon is controlled. The refractory material may be made gas permeably porous so that a pressurized gas may be blown through the surface to reduce the sticking tendency of the molten glass.

3,563,721

GLASS SHEET SUPPORTING PRESS BENDING, AND CONVEYING APPARATUS

George F. Ritter, Jr., Toledo, Ohio, assignor to Libbey-Owens-Ford Glass Company, Toledo, Ohio, a corporation of Ohio

Filed May 24, 1968, Ser. No. 731,998
Int. Cl. C03b 23/02
U.S. Cl. 65—273 5 Claims



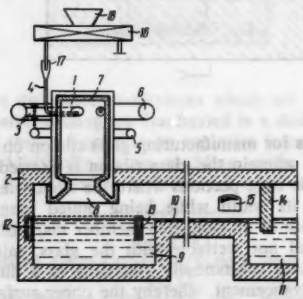
Conveyor rolls for supporting and conveying glass sheets in a press bending apparatus. Each roll comprises a driven shaft and a sheet supporting sleeve surrounding said shaft and adapted for rotation with or relative to said shaft. The shaft has limited friction driving engagement with the sleeve which permits the roll to advance an unrestrained sheet supported thereon but allows slippage to occur between the sleeve and the shaft when movement of the sheet is restrained.

3,563,722

GLASS-MELTING FURNACE

Jury Vasilievich Troyankin, Golianove, korp. 28, kv. 32; Boris Alexandrovich Sokolov, Derevnya Khimki 1; Vera Vasilievna Pollyak, B. Semenovskaya ul. 29/2, kv. 47; Yakov Vasilievich Timoshkov, Lenisky prospekt 64, kv. 62; Vadim Alexandrovich Chubinidze, Universitetsky prospekt 6, korp. 4, kv. 88; Ippolit Ilich Kuksin, B. Tulskaya ul. 54, korp. 2, kv. 73; and Ninel Pavlovna Merezhnikova, Ul. letchinka Babshikina 12, kv. 23, all of Moscow, U.S.S.R.; Jury Alexandrovich Knyazev, Bor-3, ul. Shkolnaya 1, kv. 16, Gorky, U.S.S.R.; Nikolai Pavlovich Kabanov, Nizhanaya Maslovka 6, kv. 8, Moscow, U.S.S.R.; and Mikhail Ivanovich Popov, Bor-3, ul. Shkolnaya 9, kv. 7; Dmitry Nikolaevich Shepelev, Bor-3, ul. Myakovskogo 1, kv. 3; and Vera Yakovlevna Starostina, Bor-3, ul. Myakovskogo 1, kv. 21, all of Gorky, U.S.S.R.

Filed Apr. 17, 1968, Ser. No. 722,105
Int. Cl. C03b 3/00
U.S. Cl. 65—335 10 Claims



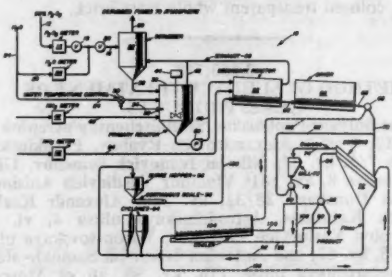
A glass melting apparatus comprises a cylindrical chamber provided with a plurality of burners tangentially disposed relative to the chamber, the burners being simultaneously supplied with a charged mixture, fuel, and gas. The outlet portion at the bottom of the chamber conically flares outwardly and downwardly. The apparatus is further provided with a tank having homogenization, clarification and cooling zones, the conically flared outlet portion of the chamber extending into the tank and being vertically spaced from the maximum level of molten product in the tank.

3,563,723

METHOD AND SYSTEM FOR MANUFACTURING AMMONIUM PHOSPHATES

Walter J. Sackett, Sr., Baltimore, and Augustus J. Sackett, Jr., Towson, Md., assignors to A. J. Sackett & Sons Co., Baltimore, Md., a corporation of Maryland

Continuation of application Ser. No. 471,919, July 14, 1965. This application Apr. 2, 1969, Ser. No. 822,797
Int. Cl. C05b 7/00
U.S. Cl. 71—34 5 Claims



An improved plant and method for manufacturing ammonium phosphates from phosphoric acid and ammonia is described. The process combines the ammonia with a diluted and somewhat preneutralized acid in a primary reactor, the partial prentutralization being done in a scrubber spraying acid and water on collected vapors. This recovers the ammonia from vapors given ofl subsequently in both the primary reactor mentioned and a subsequent secondary reactor. Thus, importantly, the scrubber, not only recovers waste ammonia, but feeds it back to the system and delivers practically purified water vapor to the atmosphere. The reactivetemperature rise in the primary reator is controlled by a thermostatically operated water supply valve which adds cold water in proportion to the neutralizing activity. The effluent from the scrubber not only is the reduced strength acid but also contains some mon-ammonium phosphate. From the primary reactor a water solution of di-ammonium and mon-ammonium phosphates having a desirable mol ratio between 1.25 and 1.45 is delivered to the secondary reactor. Selected feed-back paths are arranged whereby the resulting solid product can be regenerated until all is of a desired size granule with no waste.

3,563,724

ILLITE COATED PRILL

Joseph F. Wilson, Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware

No Drawing. Filed June 17, 1966, Ser. No. 558,258
Int. Cl. C05c 1/02
U.S. Cl. 71—59 5 Claims

Illitic Tennessee clay found in deposits near Paris, Tenn., has been found by itself to reduce the crushing strength of ammonium nitrate prills to about 5–10 pounds per square inch (friable bagset). The addition of an organic material, as described, gives a completely free flowing prill, even after a severe test. The illite described is the first applicable with good results without additives

such as organic material, e.g., an alkali sulfonate. Properties of the Paris, Tenn., deposit illite are given together with test results. A heating step which even further improves the anticaking properties which the clay can impart to the prills is also described.

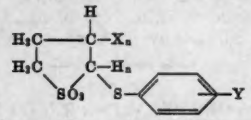
3,563,725

2-ARYLTHIODI- AND TETRAHYDROTHIOPHENE 1,1-DIOXIDES AS HERBICIDES

Douglas I. Relyea, Pompton Plains, and Richard J. Sperley, Wayne, N.J., and Ronald B. Ames, Naugatuck, Conn., assignors to Uniroyal, Inc., New York, N.Y., a corporation of New Jersey

No Drawing. Filed Oct. 30, 1967, Ser. No. 679,150
Int. Cl. A01n *9/14*; C07d *63/04, 63/08*
U.S. Cl. 71—91 **1 Claim**

Preemergent herbicides of the general formula:



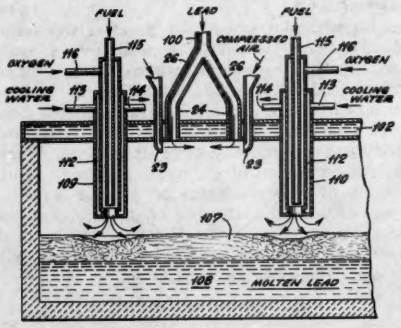
wherein X is chlorine or bromine, Y is hydrogen or an alkyl radical having 1 to 8 carbon atoms; and *n* is 0 or 1, provided that where *n* is 0, the bond requirements of the 2 and 3 carbon atoms of the thiophene ring structure are satisfied by a double bond between them, and where *n* is 1, X and Y are trans to each other, are applied to the locus of weed seeds to prevent weed growth.

3,563,726

PRODUCTION OF METAL FROM PULVERENT MATERIAL BY FLASH SMELTING IN A VORTEX

Hans Ivar Elvander and Erik Olof Albin Sundstrom, Skelleftehamn, Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Continuation-in-part of application Ser. No. 340,395, Jan. 27, 1964. This application Oct. 20, 1967, Ser. No. 676,894
Claims priority, application Sweden, Jan. 31, 1963, 1,102/63
The portion of the term of the patent subsequent to Jan. 23, 1985, has been disclaimed
Int. Cl. C21c *7/00*; C22b *9/00*; C22d *7/08*
U.S. Cl. 75—10 **14 Claims**



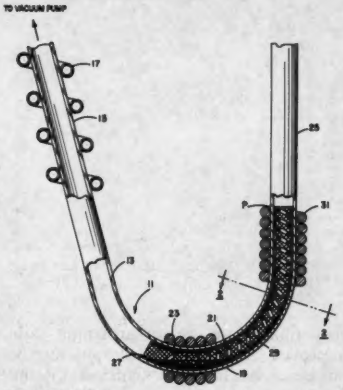
The present invention provides a reactor for processing finely-divided ores including a generally rectangular furnace chamber having bath heating elements extending through the furnace roof and depending toward the bath. The heating elements are arranged in at least one row extending lengthwise of the chamber. At least two reactants-injecting high velocity nozzles are provided between each pair of heating elements and are directed to establish a free-standing vortex unsupported by the furnace walls, which vortex is located between the respective pairs of heating elements. A charging pipe for delivering the finely-divided ore feeds through the furnace roof and discharges into a zone between the heating elements and effectively into the free-standing vortex. The heating elements of one embodiment comprise electrodes and the heating elements of another embodiment comprise fuel-fired burners.

3,563,727

METHOD AND APPARATUS FOR DISTALLATION OF LIQUIDS

James E. Webb, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Algerd Basiulis, Redondo Beach, Calif., and Paul K. Shefsiek, Acton, Mass.

Filed Jan. 11, 1968, Ser. No. 697,075
Int. Cl. B01d *3/12*; C22b *9/04*
U.S. Cl. 75—63 **10 Claims**



Method and apparatus for distillation of materials including liquid metals having at least one U-shaped tube with one upstream end connected to the device to which the purified metal is to be delivered. The material to be purified is disposed in the base of the U while the upstream leg is surrounded with cooling coils for condensation, and the downstream leg has heating coils at a portion thereof for vaporization. The bottom reservoir portion of the U is heated. Between the reservoir portion and the upstream leg of the U within the device is a capillary tube to carry the heated material from the reservoir to the heated region. A series of these tubes can be connected together in continuous fashion to produce a fractional distillation.

3,563,728

AUSTENITIC STAINLESS STEELS FOR USE IN NUCLEAR REACTORS

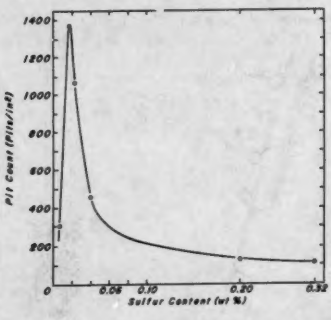
Robert J. Allio, Monroeville, and Kenneth C. Thomas and Harry M. Ferrari, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Continuation of application Ser. No. 455,781, May 14, 1965. This application Mar. 12, 1968, Ser. No. 712,572
Int. Cl. C22c *39/00*
U.S. Cl. 75—128 **4 Claims**

An austenitic stainless steel for use in a water nuclear reactor wherein the steel is in contact with coolant at elevated temperature and pressure, the alloy characterized in that it has a low neutron capture cross-section, is highly resistant to stress corrosion in the presence of chlorides and has a relatively high strength, consisting essentially of

by weight, from 17 to 22% nickel, from 14 to 19% chromium, from 0.007 to 0.015% carbon, a maximum of 0.015% nitrogen, the total of carbon and nitrogen not exceeding 0.025%, a maximum of 1.5% manganese and 0.02% cobalt, manganese and cobalt are elements which when exposed to a neutron flux are transformed at least in part to radioactive isotopes of high activity, a maximum of 0.5% silicon, other impurities not exceeding 0.5%, and the balance iron. A nuclear fuel element cladding employing said steel is also disclosed.

3,563,729
FREE-MACHINING CORROSION-RESISTANT STAINLESS STEEL
Curtis W. Kovach and Arthur Moskowitz, Pittsburgh, Pa., assignors to Crucible Inc., a corporation of Delaware
Filed Apr. 16, 1968, Ser. No. 721,647
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 **4 Claims**



This invention relates to an austenitic stainless steel having improved machinability without sacrifice in corrosion resistance, such being achieved by the addition of sulfur within a critical range of 0.04 to 0.07 percent.

3,563,730
METHOD OF PREPARING ALKALI METAL-CONTAINING ALLOYS
Richardo O. Bach and Arthur S. Gillespie, Jr., Gastonia, N.C., assignors to Lithium Corporation of America, New York, N.Y., a corporation of Delaware
No Drawing. Filed Nov. 5, 1968, Ser. No. 773,663
Int. Cl. C22b *27/00;* **C22c** *1/00, 11/02*
U.S. Cl. 75—135 **14 Claims**

Method of preparing certain alkali metal-containing alloys, particularly certain lithium-containing alloys, comprising vigorously admixing a dispersion of molten alkali metal, particularly lithium metal, in an inert liquid with one or more certain metals or metalloids in finely divided or powder form, at a temperature above the melting point of said alkali metal but below the melting point of the desired alloy, and continuing said mixing until alloying has been effectively achieved.

3,563,731
COBALT-BASE ALLOYS CONTAINING CHROMIUM, CARBON, TUNGSTEN AND NICKEL
Arthur T. Cape, Monterey, Calif., assignor to Coast Metals, Inc., Little Ferry, N.J., a corporation of Delaware
No Drawing. Filed July 28, 1969, Ser. No. 845,582
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **2 Claims**

A cobalt-base alloy containing chromium, carbon, tungsten and nickel is produced, for use in joining high temperature alloys. The alloy has a relatively high carbon content and a relatively low nickel content, such that a substantial increase in hardness is effected without sacrifice in toughness and ductility, and a better yield of rods is obtained when the alloy is ground into weld rods.

3,563,732
BEARING ALLOYS OF TIN BASED WHITE METAL
Nobukazu Morisaki, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan, a corporation of Japan
Filed July 24, 1968, Ser. No. 747,368
Claims priority, application Japan, Feb. 9, 1968, 43/7,755
Int. Cl. C22c *13/00*
U.S. Cl. 75—175 **1 Claim**

The tin based white metal bearing alloy is improved by adding 0.1 to 1.5% of cadmium, 0.001 to 0.1% of beryllium and 0.005 to 0.2% of chromium to the tin based white metal including 78 to 92% of tin, 5.0 to 13% of antimony and 3.0 to 9.0% of copper.

3,563,733
METHODS OF PREPARING RELIEF IMAGES BY ENZYMATIC DIGESTION
Selichi Taguchi, Satoru Honjo, and Eiichi Mizuki, Saitama, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan
No Drawing. Filed Jan. 23, 1968, Ser. No. 699,780
Claims priority, application Japan, Jan. 25, 1967, 42/4,898
Int. Cl. G03g *13/22*
U.S. Cl. 96—1 **6 Claims**

A recording method which comprises forming an image corresponding to the difference in the amount of an enzyme, the image being in conformity to an image to be recorded on a material capable of reacting in the presence of an enzyme and causing the reaction of said material with said enzyme by utilizing the enzyme composing said image, whereby the image to be recorded is formed on said material.

3,563,734
ELECTROGRAPHIC PROCESS
Benjamin L. Shely, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware
Continuation-in-part of applications Ser. No. 403,737, Oct. 14, 1964, and Ser. No. 567,170, July 22, 1966. This application Aug. 28, 1967, Ser. No. 663,818
Int. Cl. G03g *13/08, 13/16, 13/22, 15/08*
U.S. Cl. 96—1.4 **16 Claims**

An exposed photoconductive sheet is contacted with conductive developer powder applied from a conductive surface to which it is adhered while creating a differential electrical field between the photoconductive sheet and the conductive surface containing the adhered developer powder such that developer powder is transferred selectively to the photoconductive sheet in the nonexposed areas and separation of the photoconductive sheet from the source of supply of developer powder is made while still maintainting the influence of the electrical field and provision is made for continuing the attraction of the developer powder to the surface of the photoconductive sheet after the aforesaid separation.

3,563,735
MEROCYANINE DYE SENSITIZED PHOTOCONDUCTIVE COMPOSITION
Salvatore Emmi, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y., a corporation of Delaware
No Drawing. Filed July 15, 1968, Ser. No. 744,658
Int. Cl. G03g *5/08*
U.S. Cl. 96—1.7 **12 Claims**

Novel merocyanine dyes useful as photoconductive material sensitizers and such photoconductive materials

sensitized therewith wherein such merocyanine dyes comprise trinuclear dyes of neutral charge having a terminal nucleus comprising thiobarbituric acid or a derivative thereof. A second heterocyclic nucleus of the trinuclear dyes comprises 4-oxothiazole.

3,563,736

PHOTOCONDUCTIVE COATINGS

Frank T. Koehler, Jr., Plainfield, and Albert L. Micchelli, Middletown, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed Feb. 12, 1968, Ser. No. 704,569

Int. Cl. G03g *5/08*

U.S. Cl. 96—1.8 **8 Claims**

A photoconductive coating for application to a solid substrate which is to be utilized in electrophotographic operations, said coating comprising a layer of zinc oxide pigment bonded with a copolymer of vinyl acetate and a substituted or unsubstituted mono-ester of maleic acid.

3,563,737

METHOD OF MANUFACTURING A PLURALITY OF RELATIVELY MATCHED MASKS USED IN THE PRODUCTION OF PHOSPHOR SCREENS

Johannes Josephus Antonius Jonkers, Emmasingel, Eindhoven, Netherlands, assignor, by mesne assignments, to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware

Filed Sept. 6, 1967, Ser. No. 665,898

Claims priority, application Netherlands, Sept. 13, 1966, 6612852

Int. Cl. G03c *5/04*

U.S. Cl. 96—27 **3 Claims**

A method of making matched masks each consisting of a glass carrier provided with portions previous to radiation which are used in the manufacture of a luminescent display screen for a cathode ray tube for color display. This screen comprises at least two sets of striplike surfaces which luminesce under electron impact with different colors and are separated by nonluminescing light impervious strips and strips which produce an index signal upon electron excitation. These masks are manufactured by first exposing a photosensitive layer through an auxiliary mask to form a negative corresponding to one set of strips and repeating this procedure to form a negative for each set of strips and thereafter exposing a photosensitive layer through one of the negatives to form a mask corresponding to one set of strips and repeating the procedure to form a mask for each set of strips.

3,563,738

COPYING PROCESS AND MATERIALS

Kohei Itano, Hachioji-shi, Masashi Nakano, Nishitamagun, Shoichiro Hoshino, Narimune, and Akira Kato, Hachioji-shi, Japan, assignors to Keuffel & Esser Company, Hoboken, N.J., a corporation of New Jersey

No Drawing. Filed Oct. 16, 1967, Ser. No. 675,317

Claims priority, application Japan, Oct. 18, 1966, 41/68,252

Int. Cl. G03c *11/12*

U.S. Cl. 96—28 **10 Claims**

A photocopying and reproduction material useful in copying various colors is provided by combining a first component which is thermally activatable to a tacky super-cooled state with a second light-sensitive component which, when exposed to actinic radiation, changes the heat-activatability and thermal properties of the first component. Actinic exposure and heating in combination with the application of contrasting dust development provides clear copies of original graphics. The materials are useful also in the production of multiple copies.

3,563,739

NOVEL PRODUCTS, PROCESSES AND COMPOSITIONS COMPRISING METAL-COMPLEXED DYE DEVELOPERS

Elbert M. Idelson, Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 487,033, Sept. 13, 1965. This application Feb. 11, 1969, Ser. No. 798,438

Int. Cl. G03c *5/54, 1/40*

U.S. Cl. 96—29 **30 Claims**

Photographic products, processes and compositions for forming dye images employing a metal-complexed dye having bonded to the metal-complexing atom by at least one coordinating atom a substantially colorless ligand containing a silver halide developing function, which complexes may be illustrated schematically as follows:

DYE—Me—LIGAND-DEVELOPER

3,563,740

USE OF DICYANAMIDES IN AND WITH PHOTOSENSITIVE SYSTEMS

Grant M. Haist, James R. King, and Lance H. Bassage, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey

No Drawing. Filed Sept. 28, 1967, Ser. No. 671,218

Int. Cl. G03c *5/54, 5/30, 1/76*

U.S. Cl. 96—29 **17 Claims**

Dicyanamides are incorporated in or employed with silver photosensitive systems. Dicyanamides can be incorporated in silver halide developing compositions to provide greater covering power. They can be employed in low solvent developing compositions to enable such compositions to be used in solvent transfer processes. The silver dicyanamide complex is light sensitive and can be employed alone or in combination with silver halide in photographic emulsions.

3,563,741

PHOTOPOLYMERISATION OF ETHYLENICALLY UNSATURATED ORGANIC COMPOUNDS

Gerard Albert Delzenne, Gravenwezel, and Urbain Leopold Laridon, Wilrijk, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium, a Belgian company

No Drawing. Filed Aug. 5, 1968, Ser. No. 749,950

Claims priority, application Great Britain, Sept. 8, 1967, 41,218/67

Int. Cl. G03c *1/68*

U.S. Cl. 96—35.1 **8 Claims**

Photopolymerization of ethylenically unsaturated organic compounds using epoxy ketone initiators.

3,563,742

NOVEL PHOTOSENSITIVE ELEMENTS AND PROCESSES

Georges A. Phlipot and Simone J. Kempen, Vincennes, France, assignors to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey

No Drawing. Filed Nov. 28, 1967, Ser. No. 686,313

Claims priority, application France, May 3, 1967, 104,991

Int. Cl. G03c *1/70, 11/12*

U.S. Cl. 96—28 **15 Claims**

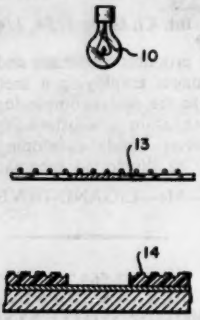
Photographic images can be prepared by exposing to actinic radiation a composition comprising a film-forming binder, a polymerizable monomer, a photodegradable inhibitor which inhibits the polymerization of the monomer and a sensitizing dye which upon photo-exposure catalyzes the photodegradation of the inhibitor and then developing an image by solvent development or thermal transfer.

3,563,743

PROCESS FOR PREPARING REFLECTION REPLICA USED IN OPTICAL PROCESSING SYSTEM

Sam P. Cook, Bellaire, Tex., assignor to Shell Oil Company, New York, N.Y., a corporation of Delaware

Filed June 28, 1967, Ser. No. 649,532
Int. Cl. G03f 5/00, 7/24; G02b 1/10
U.S. Cl. 96—38 5 Claims



A process for improving the quality of the reflection replica used in the optical data processing system described in the copending application of S. P. Cook, Serial No. 451,795, now Patent No. 3,438,693. The improved reflection replica is obtained by coating a flat reflective surface with a photosensitive plastic material and then exposing the coated surface to light that passes through both a transparent display of the information-containing pattern and a light-diffusing screen, such as a halftone screen. The photosensitive coating is then developed so that the portion of the photosensitive coating that remains is permeated by the irregularities corresponding to the pattern of the screen.

3,563,744

THERMODIAZO COPYING PROCESS

Albert Lucien Poot, Kontich, Jean Marie Nys, Mortsel, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium, a Belgian company

No Drawing. Filed Jan. 9, 1969, Ser. No. 790,149
Int. Cl. G03c 1/58, 5/18
U.S. Cl. 96—49 8 Claims

A thermaldiazo copying material and process therefor wherein a hydrazone compound decomposes upon heating to form a heterocylic methylene base compound capable of coupling with a diazonium compound to form an azo dye image.

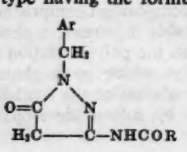
3,563,745

SILVER HALIDE PHOTOGRAPHIC MATERIALS CONTAINING 1-ARYLMETHYL-2-PYRAZOLIN-5-ONE COLOR COUPLERS

Hector Alfons Vanden Eynde, Mortsel, Robert Joseph Pollet, Berchem, and Arthur Henri De Cat, Mortsel, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium, a Belgian company

No Drawing. Filed Aug. 31, 1967, Ser. No. 664,645
Claims priority, application Great Britain, Sept. 26, 1966, 42,824/66
Int. Cl. G03c 7/00
U.S. Cl. 96—56.5 5 Claims

Colorless magenta forming color couplers of the 2-pyrazolin-5-one type having the formula:



wherein:

Ar represents an aryl group, and

R represents an alkyl radical, an aryl radical, an aralkyl radical, an alkoxy radical, an aryloxy radical, an aralkyloxy radical, an alkylamino radical, an arylamino radical or an analkylamino radical

are described. These color couplers have improved stability when stored in humid and warm atmospheres and the white image areas do not undergo discoloration.

3,563,746

USE OF BORANOCARBONATES IN A PHOTOGRAPHIC REVERSAL PROCESS

Otto Ernst and Eberhard Gunther, Leverkusen, Heinz Meckl, Cologne-Flittard, Herbert Odenbach, Bergedorf, Neukirchen, and Willibald Pelz, Opladen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany

No Drawing. Filed Jan. 27, 1969, Ser. No. 794,397
Claims priority, application Germany, Feb. 14, 1968, P 16 22 258.5
Int. Cl. G03c 5/50
U.S. Cl. 96—59 6 Claims

A reversal process in the production of positive photographic images, wherein a boroanocarbonate is used as a fogging agent in the second development step.

3,563,747

PHOTOGRAPHIC DEVELOPING COMBINATIONS

Jozef Frans Willems, Wilrijk, Antoon Leon Vandenberghe, Hove, and George Frans van Veelen, Mortsel, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium, a Belgian company

No Drawing. Filed Nov. 6, 1967, Ser. No. 680,995
Claims priority, application Great Britain, Nov. 4, 1966, 49,658/66
Int. Cl. G03c 5/30, 5/54
U.S. Cl. 96—66 9 Claims

A process and solution for developing exposed silver halide emulsions using a super-additive combination of an anionic silver halide developer such as hydroquinone or a derivative thereof and a bis[pyridone]azine substituted on the nitrogen atoms by an alkyl or an aralkyl group. Development is carried out under alkaline conditions.

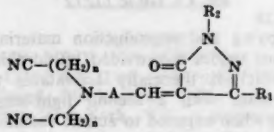
3,563,748

PHOTOGRAPHIC MATERIAL CONTAINING A FILTER DYE

Henri Depoorter, Mortsel-Antwerp, Guy Alfred Rillaers, Kontich, Felix Jan Moelants, Wilrijk-Antwerp, and Theofiel Hubert Ghys, Kontich, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium, a Belgian company

Filed Feb. 15, 1967, Ser. No. 616,343
Claims priority, application Great Britain, Mar. 3, 1966, 9,351/66
Int. Cl. G03c 1/84
U.S. Cl. 96—84 6 Claims

A light-sensitive photographic material including a dye corresponding to the formula:



wherein:

A is an arylene nucleus, or an arylene nucleus forming part of a fused ring system,

each of R_1 and R_2 is an aryl group, at least one of said

aryl groups being substituted directly or over —O—, —S—, —SO—, —SO_2—,

a —SO_2N— group, —C(=O)—, —C(=O)—O— or a —N(R)— group

wherein R represents hydrogen or an alkyl group, with an alkyl group of 5 to 20 carbon atoms, and

n represents 1, 2, or 3

is described. The photographic materials have excellent spectral absorption characteristics for filter purposes and are very resistant to diffusion.

3,563,749

LIGHT-SENSITIVE REPRODUCTION MATERIAL

Johannes Munder, Ernst-August Hackmann, and Roland Moraw, Wiesbaden-Biebrich, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany, a corporation of Germany

No Drawing. Filed Nov. 7, 1966, Ser. No. 592,286
Claims priority, application Germany, Nov. 10, 1965, K 57,618
Int. Cl. G03c *1/52*
U.S. Cl. 96—90 **5 Claims**

Light-sensitive reproduction material useful in preparing negative copies and lithographic plates by means of aqueous development methods is formed by coating a suitable support with a compositon which includes an N-vinyl compound, a halogenated hydrocarbon which splits off halogen when exposed to light, and a merocyanine dye. Light-exposed areas of the material are hydrophobic in nature, readily accept printing inks, and provide for good quality, long run lithographic printing.

3,563,750

HEXAARYLBIIMIDAZOLE HYDROXYPHTHALEIN COMPOSITIONS

Peter Walker, Red Bank, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed July 20, 1967, Ser. No. 654,720
Int. Cl. G03c *1/72*
U.S. Cl. 96—90 **18 Claims**

Visible-light activated phototropic compositions of a hexaarylbiimidazole that normally requires ultraviolet light for activation and a hydroxyphthalein dye that is a visible-light absorbing energy-transfer agent, and optionally, an oxidizable leuco form of dye, preferably an aminotriarylmethane. A method for irradiating the composition with visible light in the 400–600 mμ range.

3,563,751

HEXAARYLBIIMIDAZOLE-ACRIDINE DYE COMPOSITIONS

Robert L. Cohen, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed July 20, 1967, Ser. No. 654,721
Int. Cl. G03c *1/72*
U.S. Cl. 96—90 **18 Claims**

Visible-light activated phototropic compositions of a hexaarylbiimidazole that normally requires ultraviolet light for activation and a bis(alkylamino)acridine that is a visible-light absorbing energy-transfer agent, and optionally, an oxidizable leuco form of a dye, preferably an aminotriarylmethane. A method for irradiating the composition with visible light in the 370–520 mμ range.

3,563,752

DIAZOTYPE MATERIAL AND DIAZONIUM COMPOUNDS THEREFOR

Georg Werner, Wiesbaden-Biebrich, Arno Brauninger, Wiesbaden, and Siegfried Scheler, Wiesbaden-Schierstein, Germany, assignors, by mesne asisgnments, to Keuffel & Esser Company, Hoboken, N.J.

No Drawing. Filed Apr. 18, 1968, Ser. No. 722,174
Claims priority, application Germany, Apr. 22, 1967, K 62,089
Int. Cl. G03c *1/54*
U.S. Cl. 96—91 **7 Claims**

The use of diazonium compounds derived from unilaterally diazotized p-phenylene diamine and substituted in the o-position to the diazo group with a trifluoromethyl group provides a diazotype material of high coupling rate and improved light sensitivity from which may be obtained azo dye images of particularly good light- and waterfastness.

3,563,753

PHOTOGRAPHIC DIRECT-PRINT EMULSION COMPRISING A HYDRAZINE COMPOUND AND FORMALDEHYDE

Richard W. Karlson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey

No Drawing. Filed Oct. 2, 1967, Ser. No. 671,953
Int. Cl. G03c *1/02*
U.S. Cl. 96—94 **7 Claims**

Photographic direct-print emulsions comprising a hydrazine compound as a halogen acceptor and at least one mole of formaldehyde per mole of said hydrazine compound.

3,563,754

PHOTOGRAPHIC PROCESS

Jean E. Jones and Judith A. Schwan, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey

No Drawing. Filed Nov. 23, 1966, Ser. No. 596,415
Int. Cl. G03c *1/40, 5/24, 7/16*
U.S. Cl. 96—101 **17 Claims**

Photographic emulsions desensitized with a dye, heterocyclic compound or heavy metal salt are resensitized with a tetrazole, a triazaindene, a tetrazaindene, a pentazaindene, a pyrridine or a cyclic disulfide.

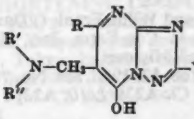
3,563,755

TETRAAZAINDENE-STABILIZED PHOTOGRAPHIC EMULSIONS

George De W. Anderson, Hatfield Broad Oak, near Bishops Stortford, and Ronald E. Watts, Bishops Stortford, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware

No Drawing. Filed Dec. 5, 1967, Ser. No. 688,022
Claims priority, application Great Britain, Dec. 9, 1966, 55,364/66
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 **2 Claims**

Tetraazaindene compounds having the formula



in which R represents a hydrogen atom, an alkyl group or an alkylthio group, R′ and R″ individually represent a hydrogen atom, a lower alkyl group or together form a 5 or 6 membered heterocyclic ring, Y represents a hydrogen atom or an alkyl, alkylthio, aryl or amine group; and

the salts thereof. This invention also describes the preparation of the abovementioned compounds and their use in photographic emulsions.

3,563,756
COATING COMPOSITIONS CONTAINING A COATING AID

George M. Gantz, Upper Saddle River, N.J., E. Scudder Mackey, Binghamton, N.Y., and Raymond L. Mayhew, Summit, N.J., assignors to GAF Corporation, a corporation of Delaware

No Drawing. Filed June 23, 1967, Ser. No. 648,217
Int. Cl. G03c *1/38*
U.S. Cl. 96—114.5 8 Claims

A coating composition and a photographic support coated therewith said coating composition comprising a water-permeable colloid and a coating aid therein comprising a small amount of at least one compound of the following structural formula:

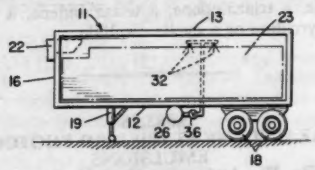
$$R-\underset{\displaystyle CH_2COOX}{\overset{|}{N}}(CH_2)_3NHCO(CH_2)_2CH_2OH$$

wherein R represents an aliphatic hydrocarbon chain containing from 8 to 20 carbons and X is selected from the group consisting of hydrogen and a water solubilizing cation.

3,563,757
APPARATUS FOR MINIMIZING PERISHABLE PRODUCTS

David A. Dixon, San Anselmo, Calif., assignor, by mesne assignments, to Oxytrol Corporation, a corporation of California

Division of application Ser. No. 534,922, Jan. 10, 1966, now Patent No. 3,365,307, which is a continuation-in-part of applications Ser. No. 356,624, Apr. 1, 1964, now Patent No. 3,239,360, Ser. No. 420,564, Dec. 23, 1964, now Patent No. 3,269,133, and Ser. No. 450,933, Apr. 26, 1965, now Patent No. 3,487,769. This application July 28, 1967, Ser. No. 671,516
Int. Cl. A23b *7/00*
U.S. Cl. 99—271 4 Claims



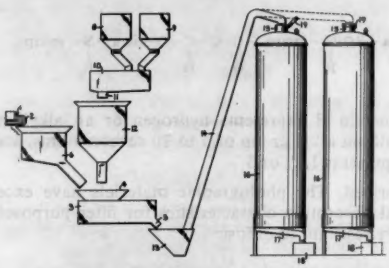
This invention relates to new and improved apparatus for controlling the oxygen concentration in a compartment by the controlled admission of inert gas thereto.

3,563,758
ANIMAL FEED OF RUMEN CONTENTS WITH MALT DIASTASE, WOOD CHARCOAL, AND PROTOPEPTONE

John A. Whiting and Willis Frank O'Daniel, Kansas City, Mo., assignors to Con-Ferm, Inc., Kansas City, Mo., a corporation of Missouri

Filed Feb. 12, 1968, Ser. No. 704,937
Int. Cl. A23k *1/10*; A23j *1/02*
U.S. Cl. 99—7 13 Claims

A feed for poultry and swine consisting of pathogen free rumen paunch contents and a control composition of a dry culture of rumen flora, sodium sulfate, malt diastase, protopeptone and a filler of charcoal and feed grain metal, the feed being processed by uniformly incorporating in the paunch contents the control composition and feed grains if desired and treating said mixture by residence in



a large volume tank under pressure and atmosphere control for conversion into a high nutrient feed.

3,563,759
CONTINUOUS FERMENTING AND RIPENING OF BEER

Hans-Carl Wolter, Zossen, Peter Lietz and Peter Steffen, Berlin, Achim Beubler, Berlin-Karolinenhof, and Peter Liebs, Berlin-Wilhelmshagen, Germany, assignors to Institut fur die Garungs- und Getrankeindustrie, Berlin, Germany, a concern of the German Democratic Republic of Berlin, Germany

No Drawing. Filed Sept. 1, 1967, Ser. No. 664,913
Int. Cl. C12c *11/14*
U.S. Cl. 99—31 5 Claims

Beer is produced in a continuous process by dividing beer worts into two partial currents, passing one of these currents through a propagation container wherein yeast is increased and a part of the extract fermented, then mixing the fermenting worts with the second current of non-fermented worts and producing fermentation and ripening in a downwardly flowing liquid column, diacetyl and an extraction portion being decomposed in the lower portion of the column by a homogeneous continuous process.

3,563,760
PRODUCTION OF A FERMENTED MILK PRODUCT

Seiji Kuwabara, Tokyo, Japan; Jun Kuwabara, sole heir of said Seiji Kuwabara, deceased, assignor to Tokyo Yakult Seizo Co., Ltd., Tokyo, Japan

No Drawing. Filed May 16, 1968, Ser. No. 729,541
Int. Cl. A23c *9/12*
U.S. Cl. 99—59 10 Claims

A process for the production of a fermented milk, to be similar to yoghurt in pleasant odor and containing active lactic acid bacteria, by fermenting whole milk or skim milk in two steps. In the first step, the yeast is cultivated in whole milk or skim milk, said yeast having no lactose fermentability and producing aromatic substances only, without causing alcoholic fermentation in the whole or skim milk. In the second step, said milk is fermented with lactic acid bacteria after sterilization of the yeast in the milk.

3,563,761
LACTALBUMIN PHOSPHATE AS PROTEIN INGREDIENT IN NON-BUTTERFAT DAIRY PRODUCTS

Rudolph H. Ellinger, New Canaan, Conn., assignor to Stauffer Chemical Company, New York, N.Y., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 605,974, Oct. 30, 1966. This application Sept. 19, 1969, Ser. No. 859,588
Int. Cl. A23c *11/00*
U.S. Cl. 99—63 12 Claims

A prepared non-butterfat dairy product containing undenatured lactalbumin phosphate. Undenatured lactalbumin phosphate has been found to serve as a replace-

ment for sodium caseinate in non-butterfat dairy product compositions. This replacement has been found to serve functionally in every respect and as a nutrient having a value equal or superior to that of sodium caseinate. Particular areas of applicability include coffee whiteners, whipped toppings, mellorines, imitation sour creams, imitation cream cheese, snack dips, baby formulas and instant breakfasts.

3,563,762
PROCESS FOR PREPARING A SOYBEAN BEVERAGE

Kwee-Seong Lo, Hong Kong, assignor, by mesne assignments, to the Hong Kong Soya Bean Products Co., Ltd., a corporation of Hong Kong

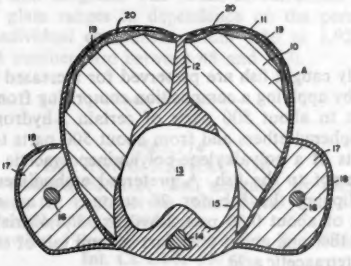
Filed Aug. 2, 1965, Ser. No. 479,686
Int. Cl. A23c *11/00*
U.S. Cl. 99—64 **14 Claims**

Soybean powder, water, and a stabilizer are mixed and then homogenized at 8000 p.s.i. to form a beverage. The beverage may additionally be centrifuged and homogenized at a lower pressure.

3,563,763
SELF-BASTING POULTRY PRODUCTS

Donald V. Schwall, Glen Ellyn, Alan B. Rogers, Palos Park, and Dennis Corbin, Lombard, Ill., assignors to Armour and Company, Chicago, Ill., a corporation of Delaware

Continuation-in-part of application Ser. No. 573,305, Aug. 18, 1966, which is a continuation-in-part of application Ser. No. 492,319, Oct. 1, 1965. This application Nov. 22, 1967, Ser. No. 685,074
The portion of the term of the patent subsequent to Jan. 30, 1985, has been disclaimed
Int. Cl. A22c *21/00*; A23b *1/00*
U.S. Cl. 99—107 **9 Claims**



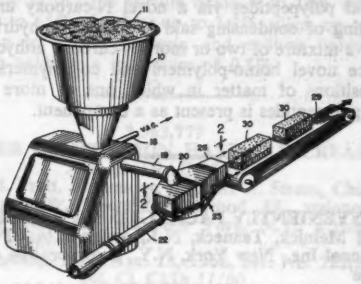
A self-basting dressed poultry carcass, which during cooking bastes the skin over the breast muscle portion of the carcass, contains within the breast enlarged reservoirs of added edible fat and flow passages lead from the reservoirs to the inner and outer surfaces of the breast skin whereby during the cooking process basting fat is supplied to the skin.

3,563,764
PREPARING POULTRY MEAT PRODUCT

Russell W. Posegate, La Grange Park, Ill., assignor to Armour and Company, Chicago, Ill., a corporation of Delaware

Continuation-in-part of application Ser. No. 699,826, Jan. 23, 1968, which is a continuation-in-part of application Ser. No. 618,729, Feb. 27, 1967. This application Apr. 23, 1969, Ser. No. 818,500
Int. Cl. A22c *21/00*
U.S. Cl. 99—107 **12 Claims**

Raw poultry pieces, which have been treated with an edible metallic salt and agitated to extract a salt-soluble coating or binder on the pieces, are extruded through a nozzle to unite the pieces and discharge them in the form of a shape-sustaining loaf onto an open support. The nozzle or extruding chamber may be divided, white meat being fed to one section at the side of the divider and dark meat pieces fed to the other section, and the two meat bodies being brought together in the nozzle or chamber to unite them in a single loaf or in an elongated body which may be sawed or cut to form separate loaves for enclosure in containers. In another embodiment, a



cellulosic casing closed at its outer end is drawn over an extrusion nozzle or pipe having a longitudinal divider plate therein to bring the closed end of the casing adjacent the discharge end of the pipe. The coated white and dark meat pieces are passed under pressure through the pipe, with the dark meat on one side of the divider plate and the white meat on the other side of the plate, to advance the casing and fill it with a measured amount of meat. The rear end of the casing is then gathered and closed.

3,563,765
LOW CHOLESTEROL DRIED EGG YOLK AND PROCESS

Daniel Melnick, Teaneck, N.J., assignor to CPC International Inc., New York, N.Y., a corporation of Delaware

Filed Aug. 31, 1967, Ser. No. 664,679
Int. Cl. A23b *5/02*; A23j *1/08*; A23l *1/32*
U.S. Cl. 99—113 **11 Claims**

The present invention is related to the production of a partially defatted dry egg yolk product. Conventional dry egg yolk solids are treated with a fat solvent at a temperature less than 160° F. to extract at least 50% but not more than 90% of the original fat from the egg yolk solids. Simultaneously, at least 50% of the cholesterol content of the egg yolk is extracted. Preferred solvents are non-polar solvents or mixtures of solvents containing at least a major portion of a non-polar solvent. Egg fat is obtained as a by-product as the solvent is recovered for reuse in the system.

3,563,766
FLUID SHORTENING COMPOSITION

Nobuya Matsui, Tokyo, Tsutomu Tomita, Chiba, and Tsukasa Kawada, Tokyo, Japan, assignors to Kao Soap Company, Ltd., Tokyo, Japan, a corporation of Japan

No Drawing. Filed Nov. 28, 1966, Ser. No. 597,231
Int. Cl. A23d *5/00*
U.S. Cl. 99—118 **5 Claims**

A fluid shortening composition comprises vegetable liquid triglycerides, solid triglycerides, emulsifiers and from 0.1–2% by weight of lecithin as a fluidity increasing agent whereby the composition remains fluid at temperatures of 5° C. and lower.

3,563,767
MARGARINE CONTAINING POLYAMIDE

David Wasserman, Springfield, N.J., John D. Garber, Hinsdale, Ill., and Frederick M. Meigs, Summit, N.J., assignors to Merck & Co., Inc., Rahway, N.J., a corporation of New Jersey

No Drawing. Continuation of application Ser. No. 647,598, June 21, 1967, which is a division of application Ser. No. 341,424, Jan. 30, 1964. This application Mar. 8, 1968, Ser. No. 711,812
Int. Cl. A23d *3/00*
U.S. Cl. 99—123 8 Claims

Novel homo- and co-polypeptides useful in a wide variety of different and unrelated arts. Methods for producing said polypeptides via a novel N-carboxy anhydride consisting of condensing said N-carboxy anhydride with one or a mixture of two or more N-carboxy anhydrides to produce novel homo-polymers and co-polymers. Novel compositions of matter in which one or more of said novel polypeptides is present as a component.

3,563,768
CONVENIENTLY PACKAGED SOUP PRODUCT

Daniel Melnick, Teaneck, N.J., assignor to CPC International Inc., New York, N.Y., a corporation of Delaware

Filed Aug. 31, 1967, Ser. No. 664,831
Int. Cl. A23l *1/40*
U.S. Cl. 99—124 8 Claims

The present invention relates to a conveniently packaged soup product for mixture and rehydration to form an instantly consumable serving. The package may be in unit or multi-unit consumption form and contains (a) a sealed, substantially moisture-proof package containing an easily rehydratable dry food material of small particulate size, and (b) a sealed, substantially moisture-proof package containing a ready-to-eat moist food adjunct of gross particulate size which is in microbiologically and organoleptically stabilized form requiring no further hydration. The amounts in each package are compatible to permit their use together in a predetermined quantity of hot water.

3,563,769
METHOD OF JELLING ARTIFICIALLY SWEETENED FOOD PRODUCTS

Louis J. Horn, Wilmette, Ill., assignor to Kraftco Corporation, New York, N.Y., a corporation of Delaware

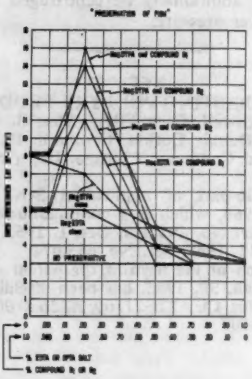
No Drawing. Filed Aug. 9, 1967, Ser. No. 659,305
Int. Cl. A23l *1/04*
U.S. Cl. 99—131 9 Claims

An artificially sweetened gelled food product is produced wherein gelling is effected with an improved gelling agent. The gelling agent is a polysaccharide gum extracted from seaweed, in combination with a high methoxyl pectin. The seaweed extract is selected from those seaweed extracts which provide clear, firm water gels with a mouth feel similar to that of conventional jellies containing sugar and gelled with pectin. Carrageenan and eucheuman extracts are preferred.

3,563,770
PRESERVATION OF FISH

Thomas E. Furia, Hartsdale, N.Y., assignor to Geigy Chemical Corporation, Ardsley, N.Y., a corporation of New York

Filed Dec. 28, 1967, Ser. No. 694,161
Int. Cl. A23b *25/00*
U.S. Cl. 99—158 3 Claims



Freshly caught fish are preserved for increased periods of time by applying a composition comprising from about one part to about 500 parts of certain 2-hydroxy-polychlorodiphenyl ethers and from about 500 parts to about 999 parts of a polyalkylene-polyaminepolyacetic acid or salts thereof to the fish. A preferred embodiment comprises dipping the fish for 20 seconds in an aqueous solution of about 0.10 part 2-hydroxy-3',4,4'-trichlorodiphenyl ether and about 0.90 part sodium salt of ethylenediaminetetraacetic acid.

3,563,771
NOVEL BLACK GLASS BEAD PRODUCTS

Chi Fang Tung, Lincoln Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware

Filed Feb. 28, 1968, Ser. No. 708,831
Int. Cl. C03c *3/00*
U.S. Cl. 106—47 9 Claims

Novel, essentially nondevitrified, black glass elements of high refractive index which are highly transmissive to infrared light and highly absorptive of visible light, said glass consisting essentially of a base glass component having ingredients capable of forming a glass with an index of refraction of at least 1.6 and dissolved light filtering components consisting essentially of 0.1–3 weight percent Cr_2O_3, 1–15 weight percent MnO_2, 0.1–10 weight percent CoO, 0–8.7 weight percent V_2O_5, 0–10 weight percent FeO, 0–5 weight percent NiO, 0–5 weight percent CuO, 0–15 weight percent CeO_2.

3,563,772
ENVELOPE FOR A SODIUM VAPOR DISCHARGE LAMP

Hendrik Jacobus Maria Joormann and Gustaaf Adolf Wesselink, Emmasingel, Eindhoven, Netherlands, assignors, by mesne assignments, to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed Dec. 28, 1967, Ser. No. 694,099
Claims priority, application Netherlands, Dec. 29, 1966, 6618308; Aug. 4, 1967, 6710744
Int. Cl. C03c *3/04, 3/08, 3/30*
U.S. Cl. 106—52 5 Claims

An envelope for a sodium vapor lamp consists of a glass resistant to attack by sodium vapor which is an alkaline earth silicate in which Al_2O_3 is present, namely a small range of compositions in the system

$RO—Al_2O_3—SiO_2$

3,563,773
OPTICAL GLASS

Heinz Brömer, Hermannstein, and Norbert Meinert and Ernst Leitz, Wetzlar, Germany, assignors to Ernst Leitz, G.m.b.H., Wetzlar, Lahn, Germany

Continuation-in-part of application Ser. No. 563,867, July 8, 1966, which is a continuation-in-part of application Ser. No. 786,726, Jan. 14, 1959. This application May 29, 1969, Ser. No. 829,033
Claims priority, application Germany, Feb. 19, 1958, L 29,720, Patent 1,061,976
Int. Cl. C03c *3/08*
U.S. Cl. 106—54 11 Claims

An optical glass is disclosed which consists essentially of (a) a glass base consisting of B_2O_3, La_2O_3 and SiO_2, (b) of ZrO_2 and Ta_2O_5, and (c) of at least one constituent selected from a group including the oxides and fluorides respectively of such metals as magnesium, calcium, barium, zinc, lead, aluminum, yttrium, titanium, niobium, and tungsten. The index of refraction of the invented glass ranges in dependence on the percentage of the individual components from 1.80 to 1.92 while the Abbé numbers are between 48 and 35.0.

3,563,774
GUNNING REFRACTORY

Glen W. Charles, Mexico, Mo., assignor, by mesne assignments, to A. P. Green Refractories Co., Mexico, Mo., a corporation of Delaware

No Drawing. Filed Nov. 2, 1967, Ser. No. 680,032
Int. Cl. C04b *35/44*
U.S. Cl. 106—64 5 Claims

A gunning refractory of the hydraulic setting agent type having low rebound loss and of a composition of 60% to 90% by weight of acid and/or neutral refractory aggregate filler, from 10% to 40% calcium aluminate cement, from 0.1% to 5% plaster of Paris, and from 0.01% to 5% short fiber asbestos.

3,563,775
8-HYDROXYQUINOLINE AS A SET ACCELERATOR FOR HYDRAULIC CEMENT CONTAINING CALCIUM ALUMINATE

Julie Chi-sun Yang, Somerville, N.J., assignor to Johns-Manville Corporation, New York, N.Y., a corporation of New York

No Drawing. Filed Apr. 1, 1968, Ser. No. 717,969
Int. Cl. C04b *7/32, 13/26, 31/02*
U.S. Cl. 106—99 10 Claims

8-hydroxyquinoline as a new and improved hydration accelerating agent for hydraulic setting cement containing calcium aluminate, its use in hydraulic cement containing aluminate and compositions thereof.

3,563,776
REFRACTORY BARIUM-AND-CALCIUM ALUMINOUS CEMENTS

Alexandru I. Braniski, Teodor D. Ionescu, and Neculaie Deica, Bucharest, Rumania, assignors to Institutul de Cercetari Metalurgice, Bucharest, Rumania, a corporation

No Drawing. Filed Feb. 20, 1968, Ser. No. 706,788
Claims priority, application Rumania, July 3, 1967, 54,196
Int. Cl. C04b *7/32, 35/10*
U.S. Cl. 106—104 3 Claims

A barium-and-calcium alumina cement consisting essentially of 22 to 37% barium oxide, 9 to 15% calcium oxide, 50 to 65% alumina, up to 1.5% silica, up to 1% Fe_2O_3, up to 1.5% magnesia and sodium oxide and potassium oxide to a maximum of 0.5%.

3,563,777
PLASTER COMPOSITION HAVING INCREASED AIR ENTRAINMENT

Richard J. Pratt, Flossmoor, Michael A. Stram, Chicago, and David W. Young, Homewood, Ill., assignors to Sinclair Research, Inc., New York, N.Y., a corporation of Delaware

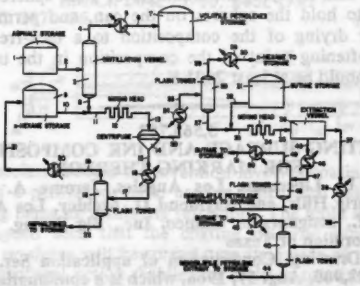
No Drawing. Filed Apr. 18, 1968, Ser. No. 722,216
Int. Cl. C11b *11/00*
U.S. Cl. 106—111 10 Claims

A plaster composition is prepared having superior air entraining properties and reduced bulk density subsequent to setting, comprising a settable gypsum plaster and a minor amount of a water-soluble salt of the ester formed by reacting styrene-maleic anhydride copolymer with a monohydric alcohol of about 1 to 12 carbon atoms. Amounts of about 0.05 to 5 weight percent of the ester salt, based on the weight of the plaster, have been found to be effective in increasing air entrainment and thereby lowering bulk density in the plaster composition.

3,563,778
PREPARATION OF IMPROVED ASPHALT COMPOSITIONS

Luke W. Corbett, Mountainside, and Robert E. Swarbrick, Belle Meade, N.J., assignors to Esso Research and Engineering Company, a corporation of Delaware

Filed Feb. 14, 1966, Ser. No. 527,212
Int. Cl. C08h *13/00, 17/22;* C08j *1/46*
U.S. Cl. 106—278 11 Claims



An asphalt separation and recombination process wherein asphaltenes are precipitated from an asphalt feed and recovered. The asphaltene-free feed is then extracted with an organic solvent to form a petrolene extract and a petrolene raffinate. The asphaltenes and petrolene extract are subsequently recombined to produce improved asphalt paving binders.

3,563,779

AQUEOUS METALLIC FLAKE COMPOSITIONS

Isao Higaki, Gose-shi, Japan, assignor to Showa Aluminum Powder Co., Ltd., Gose-shi, Nara, Japan

No Drawing. Filed Apr. 1, 1968, Ser. No. 717,990
Claims priority, application Japan, May 9, 1967, 42/28,875
Int. Cl. C09c *1/62*
U.S. Cl. 106—290 22 Claims

An aqueous metallic flake composition containing an alkanol amide type non-ionic surface active agent.

3,563,780

PROCESS FOR PRESERVING FLOWERS

John C. Waszkiewicz, Jr., Middle Settlement Road, New Hartford, N.Y. 13413

No Drawing. Continuation-in-part of application Ser. No. 619,055, Feb. 27, 1967. This application Sept. 9, 1969, Ser. No. 856,500
Int. Cl. A01n *3/00, 3/02*
U.S. Cl. 117—3.0 2 Claims

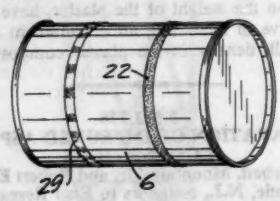
A process for preserving flowers in which a fresh flower is first dried by burying it in dry silica gel. The dried flower is then dipped in a solution of an ester-type acrylic resin and a solvent and air dried. No further protective coating or additional color-preservative is required.

3,563,781

METHOD OF PROVIDING RETRO-REFLECTIVE STRIPES ON CYLINDRICAL SURFACES

Melvin L. Johnson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware

Filed Dec. 11, 1967, Ser. No. 689,709
Int. Cl. B44c *1/00, 1/16*
U.S. Cl. 117—18 5 Claims



A method of marking cans with a reflex-reflecting stripe to afford more reliable sorting of cans in a cannery. The method comprises the application of a thin narrow stripe of a solvent-containing adhesive composition to the can surface, drying the stripe to develop a highly tacky stripe on the can, applying a monolayer of glass spheres to the stripe to hold the spheres on the can, and permitting a further drying of the composition to a tack-free state. The softening point of the composition in the tack-free state should be at least 260° F.

3,563,782

WRITING SURFACE AND INK COMPOSITION FOR MARKING THEREON

Isaiah U. Liberman, Los Angeles, Jerome A. Woolf, Beverly Hills, and Raymond D. Atchley, Los Angeles, Calif., assignors to Gamco, Inc., Big Spring, Tex., a corporation of Texas

No Drawing. Continuation of application Ser. No. 572,900, Aug. 17, 1966, which is a continuation-in-part of application Ser. No. 281,773, May 20, 1963. This application July 31, 1969, Ser. No. 849,252
Int. Cl. B43l *1/12*; B44d *1/22*
U.S. Cl. 117—37 16 Claims

A pigmented sheet of polyethylene plastic having a density in the range of about 0.95 to about 0.96, having a uniform, substantially smooth, non-glossy surface, and having minute indentations in the surface causing the surface to receive and retain an ink marking composed of a plurality of essentially dry dye particles which adhere to the surface of the sheet but which may be readily removed therefrom by light mechanical abrasion.

3,563,783

NON-ELECTROLYTIC PLATING OF THE THERMOPLASTIC RESIN ARTICLES

Toramitsu Sukuma, Osaka-fu, Japan, assignor to Sumitomo Naugatuck and Company, Ltd., Osaka, Japan, a corporation of Japan

No Drawing. Filed Feb. 1, 1968, Ser. No. 702,210
Int. Cl. B44d *1/092*; C23c *3/00*
U.S. Cl. 117—47 14 Claims

Mixing of an alkaline earth metal sulfide (e.g. calcium sulfide, barium sulfide) with a thermoplastic resin (e.g. ABS resin), prior to shaping and non-electrolytic plating, results in improved adhesion of the plating.

3,563,784

PRE-ACTIVATION TREATMENT IN THE ELECTROLESS PLATING OF SYNTHETIC RESIN SUBSTRATES

William P. Innes, Cheshire, Eugene D. D'Ottavio, Thomaston, and Sharon D. Brown, Waterbury, Conn., assignors to MacDermid Incorporated, Waterbury, Conn., a corporation of Connecticut

No Drawing. Filed Sept. 9, 1968, Ser. No. 758,589
Int. Cl. C23c *3/00*; B44d *1/40*
U.S. Cl. 117—47 4 Claims

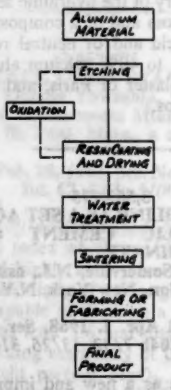
Aqueous dilute surfactant solutions are employed in the treatment of plastic substrates to prepare them for electroless plating to ensure complete coverage of the substrate surface by the metal. The substrates are immersed in the surfactant solution as a preliminary step immediately preceding the activation of the substrate in the normal cycle of electroless plating operations, supplanting various other pre-activation steps and, unlike such prior steps, being operative for all types of synthetic resins encountered in electroless plating operations.

3,563,785

METHOD OF RESIN COATING OF THE METAL AND RESIN-COATED METAL PRODUCT THEREFOR

Toshisaburo Oga, Kobe-shi, and Ken Okazaki, Amagasaki-shi, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan, a corporation of Japan

Filed Oct. 4, 1966, Ser. No. 584,223
Claims priority, application Japan, Oct. 9, 1965, 40/61,681; Nov. 27, 1965, 40/72,577, 40/72,578, Sept. 17, 1966, 41/61,596; Sept. 22, 1966, 41/62,764
Int. Cl. B44d *1/092*
U.S. Cl. 117—48 8 Claims



The method of coating an aluminum or aluminum alloy surface with a resin wherein the surface is anodically etched in a halide solution to provide minute surface ir-

regularities and cavities to adequately anchor the resin to be applied. The etched surface may be oxidized to provide greater anchorage and may also be heat treated with hot water or steam either prior or subsequent to resin coating to further enhance the resin bondage and service life.

3,563,786

METHOD OF RENDERING WATER-PERVIOUS BUILDING MATERIALS HYDROPHOBIC

Sydney Arthur Tse, 15 Constable St.; Cedric Jack Tse, 531 Broadway, Strathmore Park; and Charles Athol Pierard, 20 Milne Terrace, all of Wellington, North Island, New Zealand

No Drawing. Filed Sept. 18, 1967, Ser. No. 668,707
Claims priority, application New Zealand, Sept. 22, 1966, 146,437
Int. Cl. B44d *1/44;* **C04b** *31/44*
U.S. Cl. 117—62.1 **17 Claims**

A method of water-proofing water pervious building material wherein the building materials are impregnated with an emulsion of unsaponified wax globules in an aqueous solution of a water soluble soap or soaps. This impregnant composition is then contacted with an aqueous solution of water soluble metal salt or salts to precipitate an insoluble metallic soap. An antioxidant is used in the mixture to prevent ultraviolet light degradation.

3,563,787

ALUMINUM PLATING PROCESS

Roger G. Schneggenburger, Freeland, and Reinhold Hellmann and Kenneth O. Groves, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,636
Int. Cl. B44d *1/14*
U.S. Cl. 117—71 **13 Claims**

A process for providing at least two distinct superimposed coatings on a substrate material, one coating comprising a film of metallic aluminum adjacent to said substrate and the other comprising a protective resin overcoat for said aluminum. The process comprises depositing an aluminum hydride decomposition metal catalyst on said substrate; depositing an aluminum hydride material on said substrate in contact with said catalyst; immersing the substrate in a heated inert liquid bath containing a dissolved resin overcoating material thereby decomposing said aluminum hydride material and providing a metallic aluminum coating on said substrate; removing said aluminum coated substrate from said bath and removing the inert liquid to provide a resin overcoat on said metallic aluminum coating.

3,563,788

WOOD STRUCTURES AND THEIR MANUFACTURE

Gordon E. Brown and Richard R. Huff, Seattle, Wash., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 311,240, Sept. 24, 1963. This application Aug. 28, 1968, Ser. No. 755,792
Int. Cl. D21j *3/00*
U.S. Cl. 117—72 **5 Claims**

Overlays for wood products are formed from a mixture of wood fibers having a bulk density of up to about 0.16 grams/cc. and an aqueous phenol-formaldehyde resole resin solution. Preferably the resole resin is an acid catalyzable sulfonated phenol-formaldehyde resole resin. The overlay is formed by depositing a coating of a thermosetting resin onto a wood substrate, depositing a mixture of wood fibers and a phenolic resole resin onto the coated substrate, depositing a quantity of water onto the wood fiber-resin admixture, and subjecting the same to heat and pressure. The overlay exhibits exceptional functional properties, i.e. tensile strength.

3,563,789

CORROSION RESISTANT METALLIC SUBSTRATES

William Ross Moore, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Feb. 16, 1968, Ser. No. 705,950
Int. Cl. B32b *15/08*
U.S. Cl. 117—75 **7 Claims**

An article of manufacture is described which comprises a corrosion resistant metallic substrate. The normally corrosion-prone metallic substrate is rendered corrosion resistant by the application of about 0.05 to about 25 grams of a high molecular weight olefin polysulfone per square foot of metallic substrate. The substrate can be painted before or after the application of the resin. The resin is applied to the substrate by means of a liquid dispersion containing the dispersed resin such as water containing a surfactant or an organic solvent.

3,563,790

OPEN-TOP POROUS CONTAINER HAVING SEALED EXTERIOR SURFACE

Richard J. Pratt, Flossmoor, Donald E. Safford, Park Forest, and William S. Hoock, Flossmoor, Ill., assignors to Sinclair Research, Inc., New York, N.Y., a corporation of Delaware

No Drawing. Original application Nov. 6, 1967, Ser. No. 680,955, now Patent No. 3,511,692. Divided and this application Oct. 23, 1969, Ser. No. 871,208
Int. Cl. B05c *8/00*
U.S. Cl. 117—94 **7 Claims**

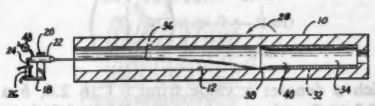
An open-top, porous container made of light weight aggregate and a binder such as sodium silicate or portland cement is dipped in an aqueous medium containing sodium silicate and finely divided silica filler. The dipping operation is conducted to wet and coat the exterior but not the interior surfaces of the container and after heat curing of the coated container the exterior surfaces are effectively sealed while the interior surfaces remain porous. Such porous surfaces can exert a wicking action when a hydrocarbon fuel, e.g., wax, in the container is burned to supply heat, for instance, to orchards or other crops in combating frost.

3,563,791

METHOD OF COATING THE INSIDE OF A CYLINDRICAL MEMBER

Nathan Janco, P.O. Box 947, Tulsa, Okla. 74101

Continuation-in-part of application Ser. No. 689,862, Dec. 12, 1967. This application May 9, 1969, Ser. No. 823,468
Int. Cl. B04c *13/06;* **B05c** *7/02*
U.S. Cl. 117—95 **5 Claims**



In preferred form the invention involves coating the inside of a permanent mold used in centrifugal casting, the coating being an insulating refractory. The mold is rotated at a speed such that the coating material supplied as liquid or slurry will be spread over the inside of the mold by centrifugal action. While the mold is rotating an unbroken stream of the coating material of suitable consistency or viscosity, which will solidify on passage of time, is directed into the mold in an axial direction from one end thereof and at such an inclination to the axis and with such force that it will impinge upon the inner surface of the mold adjacent but spaced from the opposite end whereupon its momentum will cause it to flow toward said opposite end and part of it to reach said opposite end after it impinges on the surface of the mold. This stream, after being allowed to flow for a sufficient time to coat

the portion of the mold between its point of initial impingement and said opposite end, is directed at a gradually lowering angle or pressure or from a gradually receding portion so that it progressively impinges at points closer to said one end until the entire interior of the mold is coated. The flow of coating material is then shut off and rotation continued until the coating solidifies sufficiently that it will remain in place.

3,563,792

PROCESS FOR COATING NONABSORBENT FIBRES

Hendrik H. J. Deuzeman, Watford, Ontario, Canada, assignor to Fiberglas Canada Limited, Toronto, Ontario, Canada

No Drawing. Continuation of application Ser. No. 468,949, July 1, 1965. This application Sept. 24, 1969, Ser. No. 871,749

Int. Cl. C03c *25/00*

U.S. Cl. 117—126 5 Claims

A mat of nonabsorbent fibrous material such as glass fibers is coated with an aqueous slurry of clay having from 6 to 25% solids and comprising acicular calcium silicate particles of such shape and size that at least 20% thereof will pass through the interstices of the mat in only one direction, the remaining particles being of a size such as they will all pass through the interstices in any direction, the aqueous slurry comprising a methyl cellulose type protective colloid; a wetting agent consisting of a fatty acid amide or an amine salt serving to lubricate the acicular particles for longitudinal passage through the interstices of the mat and a viscosity control agent, thus facilitating entry of the particles into the interstices of the mat. The process aspects are also claimed, as well as the resulting treated mat.

3,563,793

FIREPROOFED CELLULOSIC MATERIAL

Hans Brandeis, Limburgerhof, Pfalz, Klaus Pfleger, Ludwigshafen (Rhine), and Heinz Bille, Limburgerhof, Pfalz, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

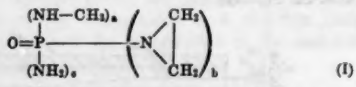
No Drawing. Filed July 3, 1968, Ser. No. 742,182

Claims priority, application Germany, July 5, 1967, P 15 94 937.8

Int. Cl. C09d *5/18;* C09k *3/28*

U.S. Cl. 117—136 4 Claims

Fireproofing cellulosic fibrous material with compounds having the formula:



(I)

in which *a* denotes a value from 0.1 to 2.6, *b* a value from 0.3 to 2 and *c* a value from 0.1 to 1.0 the total of *a*, *b* and *c* being 3, and cellulosic material fireproofed therewith.

3,563,794

FIBROUS MATERIALS IMPARTED HYDROPHILIC AND ANTISTATIC PROPERTIES AND THE IMPROVED METHOD FOR PRODUCING THE SAME

Hiroyuki Moriga, Ibaragi-shi, Japan, assignor to Teijin Limited, Osaka, Japan, a corporation of Japan

No Drawing. Filed Feb. 15, 1968, Ser. No. 705,607

Claims priority, application Japan, Feb. 20, 1967, 42/10,827; July 11, 1967, 42/44,613

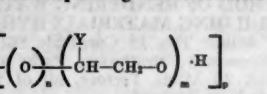
Int. Cl. B44d *1/44;* B32b *27/08, 27/34*

U.S. Cl. 117—138.8 6 Claims

Improved fibrous materials having a hydrophilic property and a durable antistatic property are prepared by applying a treatment liquid consisting of at least the three components:

(a) an N-substituted polyamide whose amount of combined formaldehyde is 3–15% by weight,

(b) an alkoxylated derivative of an aliphatic nitrogen or oxygen containing compound having an active hydrogen atom bonded to the nitrogen or oxygen atom and containing at least two functional groups, said derivative corresponding to the formula:



wherein R is an aliphatic group derived from said nitrogen or oxygen containing compound, said nitrogen or oxygen containing compound being selected from:

(i) aliphatic polyhydric alcohols;

(ii) aliphatic heterocyclic polyhydric alcohols;

(iii) fatty acid esters of aliphatic alcohols;

(iv) polyalkylene polyamines; and

(v) polyoxyalkylene polyamines

Y is selected from the group consisting of hydrogen and methyl;

n is selected from 0 and 1;

m is the number of moles of alkylene oxide reacted with said nitrogen or oxygen containing compound; and

p is a positive integer such that $m \times p$ is 5–100; and

(c) a catalyst which is either an acid or an acid-forming substance,

to a synthetic fibrous material and heat-treating the so-treated fibrous material to cause the reaction of the aforesaid components (a), (b) and (c) to take place on said material.

3,563,795

TEXTILES IMPREGNATED WITH AN AMINOPLAST RESIN AND A VINYL ESTER CARBOXYLIC ACID ESTER SOIL RELEASE AGENT

Charles R. Williams, Longmeadow, and Elmer H. Rossin, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Filed July 8, 1968, Ser. No. 743,020

Int. Cl. B32b *27/30;* D06m *15/00*

U.S. Cl. 117—139.4 10 Claims

Disclosed herein is an improvement in a process for imparting soil release characteristics to textiles wherein the improvement comprises employing as the soil release agent a water-soluble interpolymer of a vinyl ester with a partial ester of an ethylenically unsaturated dicarboxylic acid or anhydride.

3,563,796

PROCESS FOR PREPARATION OF POLYACROLEIN FILMS

Kiyoshi Yamaki, Tokyo-to, Shigeyuki Suzuki, Sagamihara-shi, and Satoshi Fujimoto, Tokyo-to, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

No Drawing. Filed May 27, 1966, Ser. No. 553,327

Claims priority, application Japan, May 31, 1965, 40/31,833

Int. Cl. C08f *3/40;* C08g *37/02*

U.S. Cl. 117—161 4 Claims

Process for the preparation of resinous films having excellent mechanical and solvent resistant properties comprising forming a film in the presence of an acid of an acetal of a poly-(alpha, beta-ethylenically unsaturated) aldehyde and heating the resulting film at a temperature of from about 70° C. to about 280° C.

3,563,797

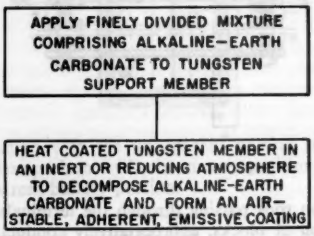
METHOD OF MAKING AIR STABLE CATHODE FOR DISCHARGE DEVICE

Robert G. Young, Nutley, and Albert W. Wainio, Livingston, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Continuation-in-part of application Ser. No. 618,021, Feb. 23, 1967. This application June 5, 1969, Ser. No. 830,836

Int. Cl. H01j 19/04, 19/06

U.S. Cl. 117—223 11 Claims


APPLY FINELY DIVIDED MIXTURE COMPRISING ALKALINE-EARTH CARBONATE TO TUNGSTEN SUPPORT MEMBER
HEAT COATED TUNGSTEN MEMBER IN AN INERT OR REDUCING ATMOSPHERE TO DECOMPOSE ALKALINE-EARTH CARBONATE AND FORM AN AIR-STABLE, ADHERENT, EMISSIVE COATING

Method of producing gasless, electron-emissive alkaline-earth oxide coated tungsten electrode, whereby the electrode is activated and rendered chemically stable prior to incorporation into a discharge device by heating the tungsten electrode coated with alkaline-earth metal carbonate to convert the carbonate to the oxide and render the oxide air stable.

3,563,798

PREGELATINIZED STARCH PRODUCTS AND PROCESS OF MAKING SAME

Felix J. Germino, Palos Park, Francis E. Kite, Riverside, and Edwin H. Christensen, La Grange Park, Ill., assignors to CPC International Inc., New York, N.Y., a corporation of Delaware

Filed Sept. 18, 1967, Ser. No. 668,617

Int. Cl. C13l 1/08

U.S. Cl. 127—32 26 Claims

Cold-water-swelling starches which form aqueous pastes of exceptionally high viscosity are prepared by subjecting, in a confined zone, a slurry of waxy starch, a solvent for starch, and an organic liquid which is miscible with the solvent for starch, to gelatinizing conditions. The treatment conditions and proportions of ingredients are so selected to cause from 0% to about 75% of the waxy starch granules to become fragmented, and the non-fragmented granules to be non-birefringent. After treatment the slurry is combined with additional organic liquid, and the processed starch is then recovered.

3,563,799

PURIFIED LIQUID SUGAR CONCENTRATE AND METHOD OF MANUFACTURING SAME

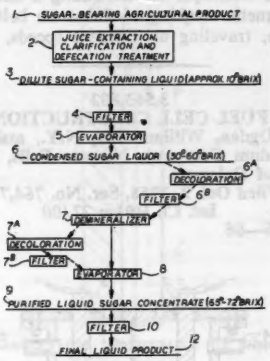
James F. Zievers and Clay W. Riley, La Grange, and Charles J. Novotny, Hickory Hills, Ill., assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill., a corporation of Illinois

Filed Oct. 2, 1967, Ser. No. 672,298

Int. Cl. C13d 3/14, 3/00; C13f 3/00

U.S. Cl. 127—46 2 Claims

A pure liquid sugar concentrate of at least 65° Brix is produced directly from a dilute sugar-containing liquid in a refining process which excludes crystallization as a required procedure in the method of purification. The refining includes concentration, demineralization in a



mixed resin ion exchanger, further concentration and filtration.

3,563,800

RECHARGING ALKALINE/ZINC CELLS

Harry G. Oswin, Chauncey, and Keith F. Blurton, Hempstead, N.Y., assignors to Leesona Corporation, Warwick, R.I., a corporation of Massachusetts

Filed June 19, 1968, Ser. No. 738,229

Int. Cl. H01m 41/02

U.S. Cl. 136—30 11 Claims

An improved method of recharging a secondary battery utilizing a zinc anode is described comprising maintaining the current density during charging above the critical current density and pulse charging, i.e., charging with a periodic cut-off of current, with the on time being no greater than 200 milliseconds.

3,563,801

FLOCKED PLATE STRUCTURE FOR ELECTRIC BATTERIES

Irvin W. Cox, East Acton, Mass., assignor to Cambridge Thermionic Corporation, Cambridge, Mass., a corporation of Massachusetts

Filed Nov. 20, 1969, Ser. No. 878,434

Int. Cl. H01m 35/04

U.S. Cl. 136—64 19 Claims

A conductive metal strip for alkaline batteries carries an effectively ordered array of extremely thin, square nickel (or nickel plated iron) flakes stacked approximately normal to and transversely of the strip with their edges approximately parallel, and with one edge of each flake conductively joined to the strip by a sintered nickel fillet. The flakes are slightly separated by the mode of fabrication and by deviations from exactly normal and transverse position on the strip, and from exact flatness. These deviations are so small as compared to the generally normal and transverse positions and the flatness of the flakes, that they provide essentially regular interstices with optimal

surface area of active material and accessibility thereof to electrolyte, and minimal volume and conductive length of supporting material.

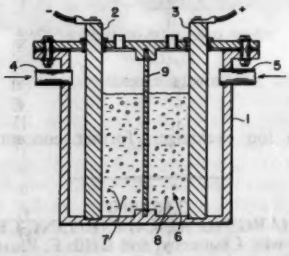
A suitable technique of fabricating a flocked strip by way of magnetic stacking of flakes on belts and finally on the strip, traveling at different speeds, is described.

3,563,802

FUEL CELL CONSTRUCTION

Rupert L. Ogden, Williamsville, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y., a corporation of Delaware

Filed Oct. 3, 1968, Ser. No. 764,730
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 **5 Claims**



This invention pertains to a fuel cell which comprises a case with porous positive and negative electrodes inserted therein dividing the interior of the case into three sections. Electrolyte fills the inner section or space. Means for introducing an oxidizing gas into the space behind one porous electrode and a fuel behind the other are provided. The inner section is divided by a porous membrane substantially parallel to the electrodes comprising synthetic fibers prepared from resin condensation products of phenols and aldehydes which can be fiberized and cured. This membrane permits communication of electrolyte between electrodes but prevents passage of small bubbles of oxidizing or fuel gases.

3,563,803

ALUMINUM-AIR BATTERY

Masayoshi Katoh, Yokohama-shi, Japan, assignor to Furukawa Denchi Kabushiki Kaisha, Yokohama-shi, Japan

Filed Oct. 25, 1968, Ser. No. 770,659
Claims priority, application Japan, Oct. 31, 1967, 42/70,090; June 17, 1968, 43/41,416
Int. Cl. H01m *11/00, 29/04, 39/04*
U.S. Cl. 136—86 **9 Claims**

An aluminum-air battery having an anode of aluminum or an alloy thereof and an alkaline electrolyte containing as an additive plumbite, plumbate or stannate, the additive being present in a concentration lower than 0.2 M. The additive inhibits self-corrosion of the aluminum electrode and raises the current efficiency, while limiting the electrolyte temperature with passage of time.

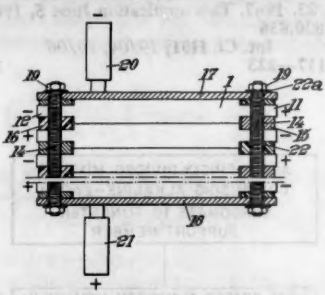
3,563,804

ELECTROCHEMICAL CELL WITH TERMINALS HAVING CONDUCTIVE OR INSULATING BLOCKS INTERPOSED

Maurice Garcin and Jean Rousset, Paris, France, assignors to Societe Les Piles Wonder, Saint-Ouen, France

Filed June 18, 1968, Ser. No. 738,068
Claims priority, application France, June 22, 1967, 111,515
Int. Cl. H01m *17/00*
U.S. Cl. 136—100 **8 Claims**

This electrochemical battery is primable with sea water. It comprises flat elements, each formed by a capsule of plastic material containing several positive electrode plates connected to a common positive terminal, several negative electrode plates connected to a common negative terminal and intercalated sheets of absorbent paper. These elements



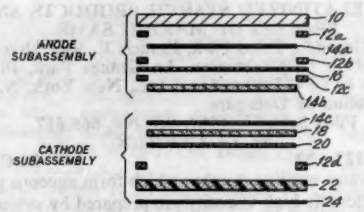
are piled on rods passing through the terminals with the interposition of blocks, appropriatively conductive or insulating. These rods are fixed by screwing in the manner of tie-rods on two end plates.

3,563,805

THIN, FLAT PRIMARY CELLS AND BATTERIES

William H. Deierhoi, Jr., Westlake, Ohio, assignor to Union Carbide Corporation, New York, N.Y., a corporation of New York

Filed Feb. 20, 1969, Ser. No. 800,986
Int. Cl. H01m *21/04*
U.S. Cl. 136—111 **9 Claims**



A thin, flat primary cell has an internal cathode confining frame to which a sheet metal anode and a cathode collector are sealed. The frame in cooperation with a tacky, immobilized adhesive electrolyte aids in maintaining low resistance contact between cell elements and also in conjunction with the anode and cathode collector serves to rigidify the cell. A battery of such cells in series relation includes two interconnected stacks.

3,563,806

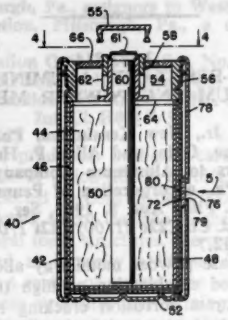
BATTERY CAPACITY AND ACTIVATION INDICATING STRUCTURE

Wayne R. Hruden, 175 Tecumseh Ave. W., Windsor, Ontario, Canada

Continuation-in-part of application Ser. No. 399,569, Sept. 28, 1964. This application Dec. 11, 1967, Ser. No. 689,470
Int. Cl. H01m *31/04*
U.S. Cl. 136—112 **6 Claims**

Battery structure including visible means for indicating the remaining capacity of the battery and for indicating activation of a deferred action battery. The structure includes a transparent battery portion and means positioned

behind the transparent battery portion for presenting a visible color change on a change in battery capacity and/or activation of the battery. A color code is provided



in conjunction with the transparent portion of the battery for comparison with the means positioned behind the transparent battery portion.

3,563,807

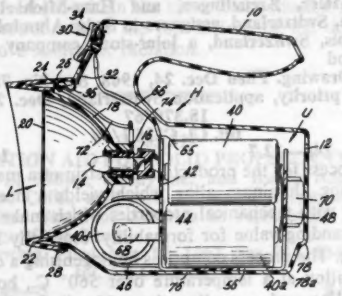
BATTERY HOLDER UNIT FOR PORTABLE ELECTRIC HAND LANTERN

Robert E. Brindley, New York, N.Y., and William H. Doring, Old Greenwich, Conn., assignors to Union Carbide Corporation, New York, N.Y., a corporation of New York

Original application June 22, 1967, Ser. No. 648,059, now Patent No. 3,456,102, dated July 15, 1969. Divided and this application Feb. 10, 1969, Ser. No. 822,773

Int. Cl. H01m *1/04*

U.S. Cl. 136—173 **1 Claim**



A portable hand lantern having a lamp and reflector assembly mounted on a housing generally rectangular in section with a cantilevered handle is powered by a number (e.g. five) of individual dry cells removably held in a removable battery unit in which pairs of cells are mounted with axes parallel to each other and an odd cell is mounted crosswise to the others, all cells being electrically connected in series.

3,563,808

TEMPERATURE MEASURING MEANS FOR ENAMEL DEVICES

Heinz Scharbach, Plankstadt, and Rudi Horsch, Schwetzingen, Germany, assignors to Pfaudler-Werke AG., Schwetzingen, Germany, a corporation of Germany

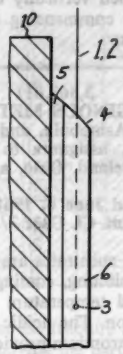
Filed Jan. 17, 1968, Ser. No. 698,489

Claims priority, application Germany, Aug. 11, 1967, P 42,803

Int. Cl. H01v *1/02*

U.S. Cl. 136—230 **7 Claims**

A thermocouple is placed on top of a pre-enamelled layer, for example forming the inside of a chemical reaction vessel, and another layer of enamel is applied thereover, fired and fused, so that the thermocouple is embedded within the enamel layer; as an alternative, the thermocouple junction may project slightly beyond the enamel layer, if it is of a material which is non-reactive



with the substances the temperature of which is to be sensed.

3,563,809

METHOD OF MAKING SEMICONDUCTOR DEVICES WITH ION BEAMS

Robert G. Wilson, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif., a corporation of Delaware

Filed Aug. 5, 1968, Ser. No. 750,080

Int. Cl. H01l *7/54*

U.S. Cl. 148—1.5 **13 Claims**

Method of fabricating a semiconductor device in which P-N junctions, protective coatings, and micro-machining operations are all performed in vacuum by means of ion beams, and in which metalization for electrodes and connections may also be applied.

3,563,810

METHOD FOR REDUCING THE CROSS SECTION OF SEMICONDUCTOR RODS BY MOLTEN-ZONE STRETCHING

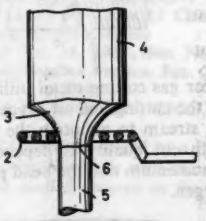
Wolfgang Keller, Pretzfeld, and Herbert Kramer, Forchheim, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany, a corporation of Germany

Application Aug. 28, 1968, Ser. No. 757,217, which is a continuation of application Ser. No. 381,744, July 10, 1964. Divided and this application June 12, 1969, Ser. No. 840,105

Claims priority, application Germany, July 13, 1963, S 86,157

Int. Cl. B01j *17/10*

U.S. Cl. 148—1.6 **2 Claims**



Method of floating zone melting a vertically mounted rod and simultaneously stretching the molten zone for reducing the rod in cross section includes placing around the top of a thin crystal seed an induction heater coil having turns of a diameter larger than the thickness of the thin crystal seed, forming the lower end of a thick rod having a diameter greater than 25 mm. and greater than the diameter of a plurality of inner turns of the coil but smaller than the diameter of at least one of the outer turns of the coil approximately into the shape of the molten zone to be produced by the coil, contacting the lower

end of the thick rod with the top of the seed and heating the junction thereof with the coil so that the turns of the coil are positioned vertically beneath the thick portion, and thereafter commencing the zone melting and stretching operations.

3,563,811

COATED FERRUGINOUS METAL AND METHOD

Jon A. de Ridder, Ashtabula, and Dick M. Warburton, Painesville, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio, a corporation of Delaware

No Drawing. Filed June 4, 1968, Ser. No. 734,242
Int. Cl. C23f 7/26
U.S. Cl. 148—6.2 4 Claims

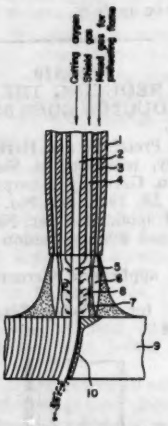
Ferruginous metal substrates are protected with an adherent, corrosion-inhibiting, coating which is the residue obtained by elevated temperature curing of an applied acidic coating solution. The acidic coating solution contains a hexavalent-chromium-providing substance, an organic polybasic acid or a salt thereof, and an inorganic acid or salt thereof. Elevated temperature curing of such solutions applied to ferruginous substrates provides a surface coating of excellent corrosion resistance.

3,563,812

METHOD FOR GAS CUTTING WHILE USING SHIELD GAS

Minoru Nakanishi and Hidehiko Hayasaki, Tokyo, Japan, assignors to Kabushiki Kaisha Tanaka Seisakusho

Continuation-in-part of application Ser. No. 681,055, Oct. 24, 1967, which is a continuation-in-part of application Ser. No. 535,885, Mar. 21, 1966. This application Apr. 3, 1968, Ser. No. 725,249
Int. Cl. B23k 7/00
U.S. Cl. 148—9 6 Claims



A method for gas cutting metal utilizing a main stream of oxygen for the cutting and an oxygen curtain surrounding said main stream to maintain the purity of said main stream wherein cut quality is dependent upon the curtain oxygen momentum and the head pressure of the main stream of oxygen.

3,563,813

CONTROLLING FRACTURE TOUGHNESS OF HIGH-STRENGTH STAINLESS STEELS

Donald Webster, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash., a corporation of Delaware

No Drawing. Filed Dec. 20, 1968, Ser. No. 785,739
Int. Cl. C21d 1/18, 7/02
U.S. Cl. 148—12.4 6 Claims

A method of controlling fracture toughness in high-strength stainless steels by heat treating procedures. The heat treated alloy retains a controlled amount of austenite which imparts fracture toughness along with a minor increase in strength.

3,563,814

CORROSION-RESISTANT ALUMINUM-COPPER-MAGNESIUM-ZINC POWDER METALLURGY ALLOYS

John P. Lyle, Jr., New Kensington, Pa., Raymond J. Towner, Lima, Ohio, and Allan P. Haarr, Delmont, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa., a corporation of Pennsylvania

No Drawing. Filed Apr. 8, 1968, Ser. No. 719,753
Int. Cl. C22c 21/00; C22f 1/04
U.S. Cl. 148—12.7 5 Claims

Aluminum base powder metallurgy alloy article having an improved combination of high transverse yield strength and stress corrosion cracking resistance. The alloy contains the basic precipitation hardening elements zinc, magnesium and copper. It may additionally contain cobalt or manganese. The alloy is prepared by atomization of a melt of the elements, hot working, solution heat treating, quenching and two-stage artificial aging. Components of the alloy in percent by weight are, in addition to the aluminum, 5 to 13 zinc, 1.75 to 6 magnesium, 0 to 2.5 copper, and up to about 3 cobalt or manganese. Up to 0.75 by weight chromium and up to 0.25 by weight zirconium may be present when cobalt or manganese is also present.

3,563,815

PROCESS FOR THE PRODUCTION OF FINE GRAINED ALUMINUM ALLOY STRIP

Rene Meier, Kreuzlingen, and Hans-Michael Cohen, Sierre, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland, a joint-stock company of Switzerland

No Drawing. Filed Dec. 24, 1968, Ser. No. 786,749
Claims priority, application Switzerland, Dec. 29, 1967, 18,378/67
Int. Cl. C22f 1/04
U.S. Cl. 148—12.7 14 Claims

A process for the production of a strip of a manganese-containing aluminum alloy which yields a fine grained product with mechanical properties which make the strip of outstanding value for formability, especially for deep-drawing. The process comprises homogenising a cast billet of the alloy at a temperature over 560° C., hot-rolling, cold-rolling and annealing the cold-rolled strip in two stages, first at a temperature below the temperature of complete recrystallization at least during five hours and in the second stage above that temperature.

3,563,816

METHOD FOR THE VAPOR GROWTH OF SEMICONDUCTORS

Shinya Iida, Hino-shi, and Yoshimitsu Sugita, Kodaira-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan, a corporation of Japan

Filed Mar. 31, 1966, Ser. No. 539,164
Claims priority, application Japan, Apr. 2, 1965, 40/18,905
Int. Cl. H01l 7/36
U.S. Cl. 148—175 2 Claims

A layer of semiconductor material is grown on a seed crystal by utilizing a gaseous reaction, wherein a gaseous source material at an initial temperature of T_1 is heated to a higher temperature, T_2, upstream from the seed crystal, and then transported downstream onto the seed crystal which is maintained at a temperature lower than T_2.

3,563,817
METHOD OF PRODUCING SILICON CARBIDE ULTRAVIOLET RADIATION DETECTORS

Hung Chi Chang, Robert B. Campbell, and Marvin L. Crull, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Original application Oct. 6, 1966, Ser. No. 584,797, now Patent No. 3,504,181, dated Mar. 31, 1970. Divided and this application Oct. 4, 1968, Ser. No. 765,238
Int. Cl. H01l *7/32*
U.S. Cl. 148—187 9 Claims

A method of producing a silicon carbide ultraviolet radiation detector in which silicon carbide is coated with silicon oxide, selected portions of the silicon oxide are removed, the exposed silicon carbide is chemically etched to produce several mesa structures, the remaining silicon oxide is removed, an impurity is diffused into the silicon carbide to form a region of second type semiconductivity including the mesa structures and forming a p-n junction therein mesa structures are removed thereby forming a plurality of junction structures, and etching at least one junction structure's region to reduce the region to a thickness no greater than 10 microns. The preferred etchant in the first etching step is a mixture of oxygen, chlorine, and argon gases.

The ultraviolet radiation detection system comprises a body of silicon carbide semiconductor material having a top surface and a bottom surface. The silicon carbide body has at least one region of a first type semiconductivity, at least one region of a second type semiconductivity, and a p-n junction formed by the interface of each pair of regions of different type semiconductivity. At least a portion of the p-n junction closest to the top surface of the body is no greater than 10 microns from the top surface whereby that portion is sensitive only to a predetermined wavelength within the ultraviolet radiation portion of the spectrum when the top surface of the device is exposed to a source of radiation.

3,563,818
IGNITION AID FOR SOLID PROPELLANTS

Clarence L. Miller, Sunnyvale, and Ralph Anderson, Saratoga, Calif., assignors, by mesne assignments, to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Apr. 17, 1967, Ser. No. 634,030
Int. Cl. C06b *19/02*
U.S. Cl. 149—3 4 Claims

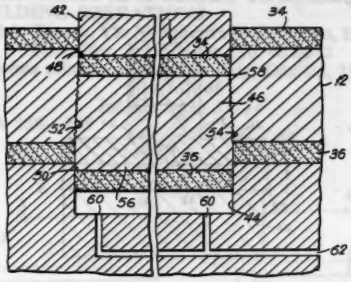
The invention comprises a process of coating a solid propellant surface with tetramethylammonium hydrotriborate to enhance ignition with liquid hypergolic oxidizer. An example is a solid composite propellant comprising a mixture of polybutadiene and an inorganic oxidizer coated with p,p'-isopropylidenediphenol, epichlorohydrin and butyl gylcidyl ether and tetramethylammonium hydrotriborate.

3,563,819
MECHANOCHEMICAL SHEET METAL BLANKING SYSTEM

Lawrence M. Rheingold, Baldwin, and Milton Berlin, Forest Hills, N.Y., assignors to Alumet Manufacturing Corporation, Middle Village, N.Y., a corporation of New York

Filed Aug. 31, 1967, Ser. No. 664,881
Int. Cl. C23f *1/02*; B23p *1/00*; H05k *3/04*
U.S. Cl. 156—6 13 Claims

A system of blanking sheet metal by using a punch and die to stamp a part out of sheet metal stock for only a portion of its thickness so that the part is substantially surrounded by a peripheral fracture but is still retained by the stock and projects a fraction of its thickness therefrom, protecting the broad faces of the part with a resist, then chemically etching the stock and part so that the

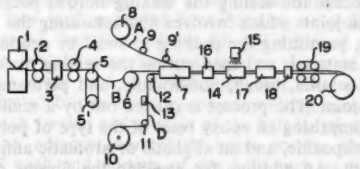


etch attacks the metal at the fracture and thereby loosens the part and finally removing the part from the stock.

3,563,820
METHOD OF MANUFACTURING A PLASTIC INSULATED WIRE

Akira Nago, Funabashi-shi, Japan, assignor to The Tujikura Cable Works Limited, Tokyo, Japan, a corporation of Japan

Filed Aug. 20, 1968, Ser. No. 753,943
Int. Cl. H01b *13/06*
U.S. Cl. 156—54 5 Claims



This invention deals with a method of manufacturing plastic insulated wires in which the insulating tape of plastic material is continuously molded to longitudinally apply it to an advancing inner conductor in the succeeding step of the process. A length of a forming tape is temporarily applied in the process to the plastic insulating tape along its length to serve as a forming member for the plastic insulating tape.

3,563,821
METHOD OF MANUFACTURING A STAINED GLASS WINDOW

Henriette M. Turtaud, La Reunion: 13 Cite Ah-Soune, Saint-Denis, France

No Drawing. Filed Jan. 18, 1967, Ser. No. 610,020
Claims priority, application France, Jan. 21, 1966, 46,760
Int. Cl. B44c *3/12*; B44f *1/06*; C03c *27/04*
U.S. Cl. 156—63 2 Claims

A stained glass window constructed as a lamination of a glass sheet and a sheet of plastic with the stained glass pieces arranged in the desired pattern on the plastic sheet prior to heating.

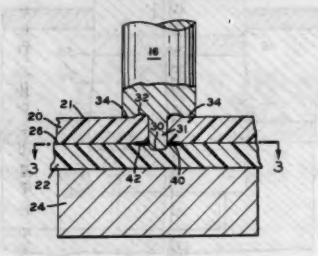
3,563,822
METHOD FOR WELDING THERMOPLASTIC PARTS BY SONIC ENERGY

Stephen Fesh, Danbury, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn., a corporation of Delaware

Filed July 3, 1968, Ser. No. 742,312
Int. Cl. B29c *27/08*
U.S. Cl. 156—73 11 Claims

Welding two superposed thermoplastic members is accomplished by providing a sonically or ultrasonically vi-

brating horn and forcing its frontal surface into one of the members toward the interface between both members. Responsive to the dissipation of sonic energy, thermo-



plastic material softens and flows at the interface, bonding both members together at the location of horn penetration.

3,563,823

METHOD FOR INTERNALLY SEALING GAS MAIN JOINTS

Gene G. Yie, Chicago, Ill., assignor, by mesne assignments, to American Gas Association, Inc., New York, N.Y., a membership corporation of New York

No Drawing. Filed June 9, 1967, Ser. No. 644,833
Int. Cl. B32b *35/00*; F16l *55/18*
U.S. Cl. 156—94 **16 Claims**

A process for sealing the leaking fibrous packings of gas main joints which involves first saturating the fibrous packing, permitting the packing to swell by action of the sealing material, and then curing the sealing material to provide a solid, tough, non-volatile, and permanent seal for the joint. The process is carried out by a sealing material comprising an epoxy resin of the type of polyglycol di- or triepoxide, and an aliphatic or aromatic amine curing agent. An additive for swelling the fibrous packing is preferably used. The sealing material is applied to the packing by pouring down an inclined gas main to a low point and permitting the sealing substance to saturate the packing; the sealant may also be applied by spraying or pressure application.

3,563,824

METHOD OF JOINING GLASSPLATE MEMBERS WITH POLYPHENYLENE OXIDES

Erich Behr, Siebengebirgsallee, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Bezirk Cologne, Germany, a corporation of Germany

No Drawing. Filed Jan. 26, 1967, Ser. No. 611,812
Claims priority, application Germany, Feb. 1, 1966, D 49,255
Int. Cl. B32b *17/10*; C03c *27/10*
U.S. Cl. 156—99 **4 Claims**

This specification describes the use of polyphenylene oxides, particularly poly-(2,6-dimethylphenol oxide) as glass cement.

3,563,825

METHOD FOR INSULATING PIPELINES WHEREIN MORE INSULATING MATERIAL IS ABOVE THE CENTER LINE OF THE PIPE THAN BELOW THE CENTER LINE

Marnell Albin Segura, East Baton Rouge, La., and Howard T. Oakley, Elizabeth, N.J., assignors to Esso Research and Engineering Company, a corporation of Delaware

Filed Jan. 26, 1965, Ser. No. 428,182
Int. Cl. F16l *59/02*
U.S. Cl. 156—187 **9 Claims**

A method of applying a pourable or foamable insulation to a pipe wherein the insulation is flowed into an outer wrapper sheet underlying the pipe, and the wrapper sheet is thereafter joined along its longitudinal edges to tightly enclose the insulation about the pipe. The method may include the preliminary step of also helically wrapping the pipe with an insulation tape. Preferably, the in-

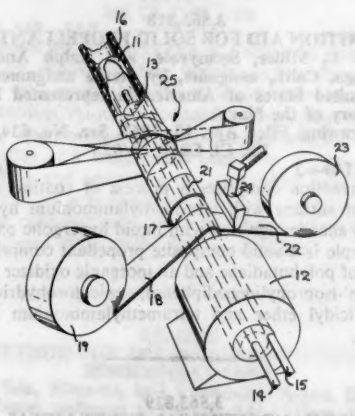
sulation is flowed into the wrapper in such a way as to place a greater proportion of the insulation on one side of the pipe than on the other to thereby obtain maximum insulation value per unit mass of insulation.

3,563,826

METHOD OF MAKING A CYLINDRICAL ARTICLE WHILE COOLING A MANDREL TO REDUCE FRICTIONAL FORCES

James C. O'Neal, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc., a corporation of Ohio

Continuation-in-part of application Ser. No. 606,929, Jan. 3, 1967. This application Jan. 2, 1968, Ser. No. 695,155
Int. Cl. B65h *81/00*
U.S. Cl. 156—190 **4 Claims**



This application discloses the construction of a cylindrical article having utility in the manufacture of can-type containers said article comprising inner and outer plies of thermoplastic material bonded to one another by a suitable adhesive. The inner and outer plies of the article are formed from spirally-wound strands of thermoplastic material. The application also discloses a spiral-winding method for forming such a cylindrical article in which a cooling medium is circulated through the winding mandrel to reduce frictional forces between the article being formed and the winding mandrel.

3,563,827

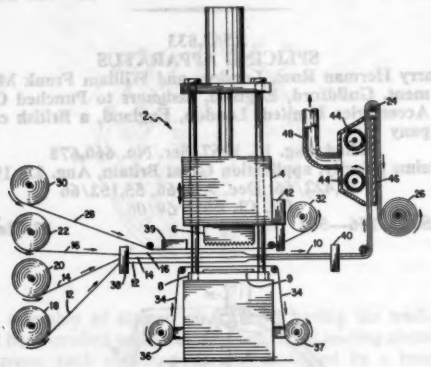
METHOD OF MANUFACTURING A DECORATIVE VINYL SURFACE

Charles W. Zylinski, North Arlington, N.J., assignor to Harte & Company, Inc., New York, N.Y., a corporation of New York

Continuation-in-part of application Ser. No. 429,452, Feb. 1, 1965. This application June 8, 1966, Ser. No. 556,124

Int. Cl. B32b *3/06*

U.S. Cl. 156—209 6 Claims



Products are produced from vinyl sheets and the like having an embossed surface and having decorative coloring deposited in the depressions. Such products are produced by simultaneously forming the depressed surface areas and depositing the decorative coloring on such areas by passing the product to be embossed and a carrier film coated with a suitable decorative ink through a heat sealing die. The heat and pressure form depressed surface areas and simultaneously transfer the ink from the carrier film to the area where heat sealing has been performed.

3,563,828

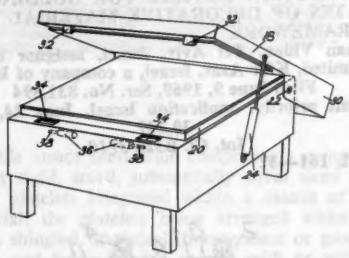
FLUID FILTERS

Dennis A. G. Marshall, Greets Cottage, Friday St., Warnham, near Horsham, Sussex, England

Filed June 14, 1968, Ser. No. 737,093

Int. Cl. B29c *25/00*

U.S. Cl. 156—228 3 Claims



A fluid filter for removing dust and other foreign matter from air and other fluid streams having a metal frame or a metal reinforcement which is bonded to one or more layers of filtering material by a coating of thermoplastic material, the coating being obtained by heating the frame or reinforcement and bringing it into contact with thermoplastic material in powder form, whereupon the powder melts and the filtering material is pressed against the coating while it is still molten.

3,563,829

METHOD FOR PREARRANGING POLYAMIDE RESIN BELTS AND STRAPS TO SUBSEQUENT WELDING OPERATIONS

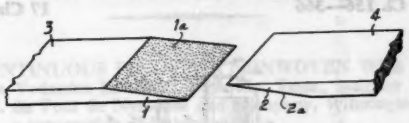
Livio Zenere, Via Margherita 9, Valdagno, Italy

Filed Dec. 1, 1967, Ser. No. 687,242

Claims priority, application Italy, Dec. 22, 1966, 14,767/66

Int. Cl. B32b *31/18*

U.S. Cl. 156—249 4 Claims



A resin belt or strap for operating machinery such as used for spinning or weaving textiles, is to have its adjacent ends bonded together to provide an operating loop. The belt is of a suitable resin material such as polyamide and its ends are to be fused or welded together at the operating site to form a loop directly on the apparatus or machinery. For this purpose, end portions of the belt material or length, before shipping to the situs of use, are oppositely-beveled or slit to provide complementary, endwise-inclined faces that match each other. Each inclined face is then wetted by a bonding or gluing agent or material that is a solvent for the resin of the belt. Next, a protective enclosing sheath or sleeve of complementary shape and of a different resin material that is not affected by the bonding-solvent wetting agent, is slid over each treated end portion of the belt length to extend along an adjacent normal thickness portion thereof. A side of each end portion of the belt, such as the opposite or fully flat side, may be given a temporary or mechanical adherence with an opposing inner side of its sheath by wetting the sheath with a type of adhesive that is a non-solvent with respect to the resin of the belt and resin of the sheath, for example, water glass (sodium silicate). The sheaths are used to protect the treated ends of the belt during shipment, storage, and until the belt is installed. The sheaths also protect the belt while it is being inserted and mounted on the operating machinery; they are pulled or stripped-off the belt ends to expose the wetted surfaces to permit such surfaces to be applied in a complementary manner with each other and clamped for heat and pressure bonding. The unitary physical bond thus produced is permanent and enables the belt to be placed in use as an operating loop.

3,563,830

PROCESS FOR PREPARING SEAMING TAPE

Charles D. Burgess, Macon, Ga., assignor, by mesne assignments, to Giffen-Burgess Corporation, a corporation of Delaware

No Drawing. Application Dec. 6, 1966, Ser. No. 599,414, now Patent No. 3,400,038, dated Sept. 3, 1968, which is a continuation-in-part of application Ser. No. 535,333, Mar. 18, 1966. Divided and this application June 26, 1968, Ser. No. 770,874

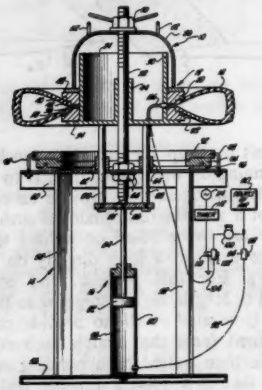
Int. Cl. B32b *7/14*

U.S. Cl. 156—291 15 Claims

A process is described for the face seaming of strips of carpeting, utilizing a seaming tape comprising a hot-melt adhesive conjointly with a joining web having open areas, and a barrier web which has not. It is essential that at least 0.12 oz. of the adhesive per foot of carpeting to be seamed be provided to accomplish lateral flow of the molten adhesive and to fill the interstices of the joining web and in the backside of the carpeting to be

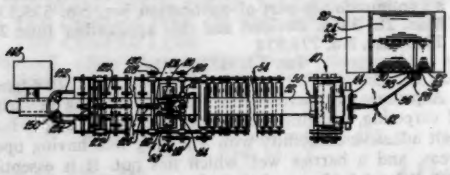
joined. The components of the tape ready for use, can be attached to each other most conveniently by utilizing the adhesive properties of the hot adhesive layer.

3,563,831
TUBELESS SIDEWALL MOLD FOR TIRES
Maurice Clapp and William M. Conley, Jr., Redlands, Calif., assignors to Clapp's Equipment Div., Mentone, Calif., a corporation of California
Filed Aug. 30, 1968, Ser. No. 756,613
Int. Cl. B29h 5/24, 17/04
U.S. Cl. 156—366 17 Claims



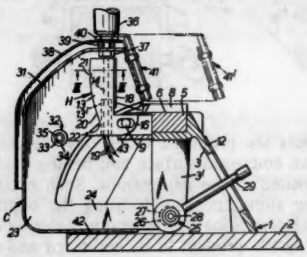
A pressure head closes a mounting drum's interior and bears against an upper bead ring to maintain the upper bead ring fixed relative to a lower bead ring and a curing matrix. A pneumatic ejection cylinder is operative to raise the mounting drum and lower bead ring above the curing matrix to collapse the beads of a tire and seat the beads in the upper and lower bead rings. Upon inflation of the tire, air pressure within the tire's interior forces the lower bead ring and the mounting drum downward against stops into a curing position. In the curing position, the lower sidewall of the tire will abut against the curing matrix for the application of a sidewall strip. After the sidewall strip is cured, the inflation pressure is released. The lower bead ring and drum will then rise by action of the pneumatic cylinder to carry the lower sidewall of the tire above the curing matrix. The tire may then be removed from the mold.

3,563,832
TIRE RETREADING APPARATUS WITH TREAD AND SIDEWALL FORMING ROLL
Donno W. Cooper, Muncie, Ind., assignor of one-third each to Darrell D. Cooper, Muncie, Ind., and Eugene Reed, Louisville, Ky.
Filed Dec. 4, 1967, Ser. No. 687,828
Int. Cl. B29h 17/37
U.S. Cl. 156—405 13 Claims



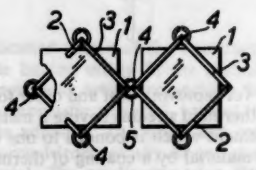
Retreading of tires is accomplished with tread stock produced by a forming roll. The tread stock formed by the forming roll is applied to a tire carcass by a tire building machine, with the tread stock forming apparatus and tire building apparatus constituting one retreading unit. With this arrangement, it is no longer necessary to purchase tread stock from outside sources, which stock is relatively expensive and may be of non-uniform, lower quality. Roll-forming of the tread stock requires relatively inexpensive apparatus and the start-up time involved is relatively short. The forming roll used for the tread stock also is adjustable and can be relatively quickly adjusted for various sizes of tread stock including widths and thicknesses.

3,563,833
SPLICING APPARATUS
Harry Herman Ross, London, and William Frank Maidment, Guildford, England, assignors to Punched Card Accessories Limited, London, England, a British company
Filed Aug. 15, 1967, Ser. No. 660,678
Claims priority, application Great Britain, Aug. 22, 1966, 37,422/66; Dec. 9, 1966, 55,152/66
Int. Cl. B65h 69/06
U.S. Cl. 156—502 17 Claims



Splicing apparatus for joining together the ends of two webs, particularly of data tape, comprises means including a bed for locating the web ends, heater means movable relative to the web locating means to engage in a closed position with the located web ends, and clamp means movable relative to both the web locating means and the heater means to close the heater means and so apply heat and pressure for joining the located web ends.

3,563,834
CONSTRUCTION DEVICES FOR HOLDING FLAT PLATES OF DECORATIVE MATERIAL WITHIN A FRAMEWORK
Nachman Vidan, Tel Aviv, Israel, assignor to Lenoy Limited, Kfar Azar, Israel, a company of Israel
Filed June 9, 1969, Ser. No. 831,594
Claims priority, application Israel, June 24, 1968, 30,247
Int. Cl. B32b 3/10
U.S. Cl. 161—37 7 Claims



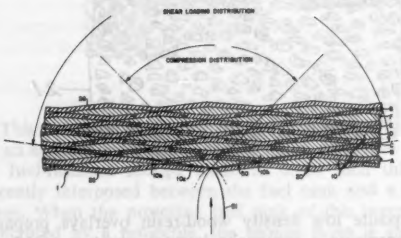
A decorative construction device for holding a plurality of flat plates of decorative material within a framework beyond which the edges of the plates extend. Connecting

links engage the framework and retain the same together so that when assembled, the device can be bent into any desired shape.

3,563,835
STAINED GLASS ASSEMBLY
John Nussbaum, 6505 79th St., Middle Village, N.Y. 11379, and Berney Harris III, 348 E. 78th St., New York, N.Y. 10021
Filed Aug. 20, 1969, Ser. No. 851,619
Int. Cl. B44f *1/08*
U.S. Cl. 161—18 **4 Claims**

An assembly of stained glass pieces having the traditional hand-crafted appearance of individual leading about each piece, such appearance being simulated by a base delineated into shaped areas by flat strips, those strips of the cover even containing mock soldering deposits. This results in a realistic hand-crafted appearance which normally is obtainable only after tedious effort but which is actually obtained in accordance with the present invention in a facilitated, simple procedure.

3,563,836
PROJECTILE ARMOR FABRICATION
Jack D. Dunbar, Lewiston, N.Y., assignor to Bell Aerospace Corporation, Wheatfield, N.Y.
Filed May 23, 1968, Ser. No. 731,411
Int. Cl. B32b *3/14*
U.S. Cl. 161—38 **6 Claims**

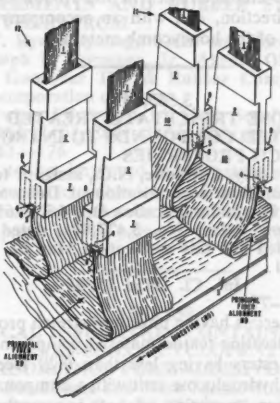


A projectile armor fabrication comprising a composite of relatively rigid, small, substantially equal sized load distributing platelets integrated within a matrix of less rigid material; the platelets being arranged withn the matrix in a shingled, statistical, interpendent or geometric pattern, and being bonded thereto with or without the aid of adhesves. The composite may be formed as a relatively light weight non-rigid sheet and employed as personnel armor or as armor protection for military aircraft, vehicles, or the like against small arms fire. The platelets are distributed within the matrix in such a manner as to provide improved distribution and absorpton of projectile-impact energy and to dampen the accoustical energy wave effects thereof by changing their amplitudes and frequencies as they are transmitted through the composite.

3,563,837
SHOCK ABSORBING MAT
Howard S. Smith, Asheville, and Leland E. Williams, Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio, a corporation of Delaware
Filed Aug. 21, 1968, Ser. No. 754,432
Int. Cl. B32b *3/00, 5/16*
U.S. Cl. 161—43 **6 Claims**

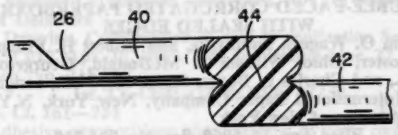
A shock-absorbing mat in which a cover is filled with a mixture of small pieces of flexible elastomeric foam material, such as latex or urethane, and semi-rigid plastic foam material, such as expanded styrene or urethane.

3,563,838
CONTINUOUS FILAMENT NONWOVEN WEB
Clifton Vedantus Edwards, Nashville, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware
Continuation-in-part of application Ser. No. 651,799, July 7, 1967. This application July 9, 1968, Ser. No. 743,516
Int. Cl. D04h *3/02*
U.S. Cl. 161—57 **12 Claims**



The invention relates to continuous filament nonwoven webs having a specified filament directionality. The continuous synthetic filaments are preferentially aligned in directions approximately parallel or perpendicular to the fabric length direction, and extend for a distance greater than 7 inches in that direction. Such webs are particularly useful as primary backings for tufted carpets since they offer exceptionally high resistance to width loss on stretching coupled with high tear strength.

3,563,839
METHOD OF FORMING WEAKENED TEAR LINES AND THE ARTICLE FORMED THEREBY
Roy R. Divis, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass., a corporation of Delaware
Filed Aug. 1, 1968, Ser. No. 749,444
Int. Cl. B32b *5/18, 31/26*
U.S. Cl. 161—57 **4 Claims**

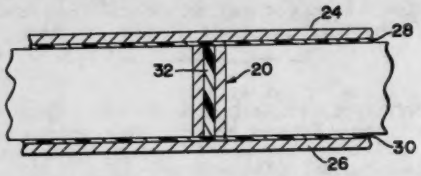


The method of providing weakened tear lines in heat-destructible material by thermally destroying a portion of the thickness of the material along desired paths.

3,563,840
HONEYCOMB HAVING EQUAL SHEAR STRENGTH PROPERTIES

Walter E. Stine, North Olmstead, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio, a corporation of Ohio

Filed June 13, 1968, Ser. No. 736,639
Int. Cl. B32b 3/12
U.S. Cl. 161—68 1 Claim



This invention modifies the conventional hexagonal honeycomb core design by changing the lengths of the sides and the angles within the hexagonal cores themselves so as to provide a honeycomb having the same shear strength characteristics in the ribbon direction as the normal direction, and with an accompanying reduction in weight of the honeycomb material.

3,563,841
CELLULOSE TRIACETATE TREATED WITH SELECTED COMPOUNDS TO INTRODUCE STRETCH PROPERTIES

William C. Sturkey, Charlotte, N.C., assignor to Celanese Corporation, a corporation of Delaware

No Drawing. Original application Oct. 15, 1965, Ser. No. 496,666, now Patent No. 3,477,806, dated Nov. 11, 1969. Divided and this application May 27, 1969, Ser. No. 847,761
Int. Cl. D03d 15/08
U.S. Cl. 161—77 4 Claims

Textile materials having improved stretch properties are produced by treating textile material comprising cellulose organic acid esters having less than 0.29 free hydroxyl groups per anhydroglucose unit with a compound selected from the group consisting of beta-butoxyethyl acetate, acetyl triethyl citrate and benzyl alcohol.

3,563,842
TWO LAYERED WATER-REPELLANT FABRIC

Manuel A. Thomas, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C., a corporation of South Carolina

Continuation-in-part of application Ser. No. 361,816, Apr. 22, 1964. This application May 20, 1969, Ser. No. 830,915
Int. Cl. A41d 3/04; D06n 3/12
U.S. Cl. 161—92 13 Claims

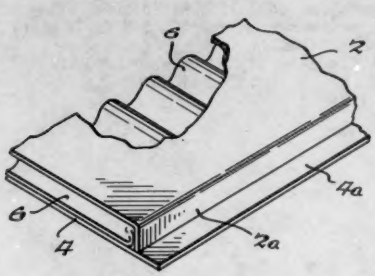
A fabric comprising a plied system having at least two separate contiguous layers of fabric, both the inner and outer fabric layers being penetrable by rain and being resistant to standing water with the inner layer being of equal or tighter construction than the outer layer.

3,563,843
DOUBLE-FACED CORRUGATED PAPERBOARD WITH SEALED EDGES

William O. Wagers, Smithville, and Robert H. Frappier, Wooster, Ohio, William S. McDonald, Georgetown, S.C., and Charles L. Boggs, Statesville, N.C., assignors to International Paper Company, New York, N.Y., a corporation of New York

Filed Apr. 16, 1968, Ser. No. 721,739
Int. Cl. B32b 3/04, 3/28
U.S. Cl. 161—133 6 Claims

A closed edge corrugated core paperboard in which the corrugated core of the board is closed by slitting and compressing the corrugated core edge and by folding the edges of the facing sheets, left projecting after the core is crushed, one folded extending edge folded over the other folded extending edge, and adhesively securing the

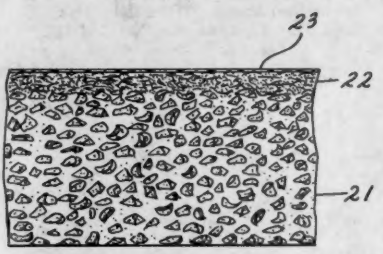


folded edges together; the method for producing such board including the steps of slitting and crushing the end of the core, folding the edges of the facing sheets, one over the other, and adhesively securing the folded edges of the facing sheets to each other.

3,563,844
WOOD OVERLAY PRODUCTS AND THEIR MANUFACTURE

Gordon E. Brown, Seattle, Wash., assignor to Monsanto Company, St. Louis, Mo., a corporation of Delaware

Continuation-in-part of application Ser. No. 390,183, Aug. 17, 1964. This application Dec. 2, 1968, Ser. No. 780,312
Int. Cl. B32b 5/28, 27/12, 27/14, 27/42
U.S. Cl. 161—158 5 Claims



Composite low density wood-resin overlays prepared by compressing a composite layered structure which includes a mat of resin coated comminuted wood chips, an interlayer of a wood fiber and phenolic resin and a face coating of a certain phenolic resin. The overlays are useful as synthetic facing veneers in plywood manufacture.

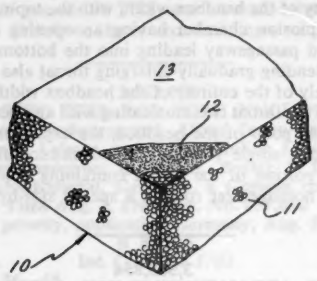
3,563,845
THERMAL INSULATING COMPOSITE STRUCTURE

James K. Stevens, Brimfield, Mass., assignor to Monsanto Company, St. Louis, Mo., a corporation of Delaware

Filed Apr. 22, 1969, Ser. No. 818,459
Int. Cl. B32b 5/18, 27/40
U.S. Cl. 161—160 5 Claims

Improved integral, three-layered plastic, thermally insulating composites each having an impact resistant solid facing layer of a monovinyl aromatic compound/alpha-electronegatively substituted ethene compound interpoly-

mer system, a layer of cellular polyurethane, and an elastomeric interlayer positioned between these two layers.



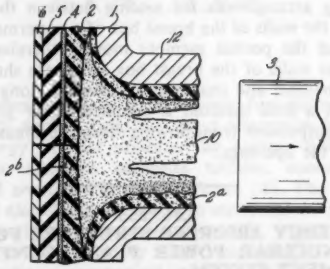
The resulting composites have improved impact resistance as respects the solid facing layer.

3,563,846

SELF-SEALING FUEL TANK

George B. Harr, Pasadena, Calif., assignor to The Firestone Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

Filed Aug. 25, 1966, Ser. No. 574,978
Int. Cl. B32b *7/06;* B65d *25/34*
U.S. Cl. 161—161 9 Claims



This invention relates to the protection of a fuel tank by an exterior composite laminate which comprises a layer of fuel-resistant sponge 0.020 to 0.125 inch thick adherently interposed between the fuel tank and a sealing layer. When the protected fuel tank of this invention is punctured by a projectile, the sponge layer is splittable so that the sealing layer separates from the tank wall around the puncture as the puncture is formed and the sealing layer swells when contacted by the fuel.

3,563,847

POLYCARBONATE MODIFIED POLYESTER REINFORCING ELEMENTS AND RUBBER STRUCTURES MADE THEREFROM

Grover W. Rye, Cuyahoga Falls, and Thomas E. Evans, Massillon, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

No Drawing. Filed June 14, 1968, Ser. No. 736,964
Int. Cl. C08d *11/04;* C08f *45/62;* C08g *39/10;* D02g *3/48*
U.S. Cl. 161—176 5 Claims

Relates to an improved rubber structure reinforced with an improved polyester reinforcing fiber modified with a polycarbonate added to the polyester prior to fiber formation.

3,563,848

METAL COMPLEX MODIFIED POLYESTER REINFORCING ELEMENTS AND RUBBER STRUCTURES MADE THEREFROM

Roop S. Bhakuni and Joseph L. Cormany, Jr., Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

No Drawing. Filed June 14, 1968, Ser. No. 736,973
Int. Cl. C08d *11/04;* C08f *45/62;* C08g *39/10;* D02g *3/48*
U.S. Cl. 161—176 21 Claims

Relates to an improved rubber structure reinforced with an improved polyester reinforcing fiber modified with either a metal complex alone or in combination with a polycarbonate alone or in combination with an isocyanate, the modifier being present in the polyester prior to fiber formation.

3,563,849

ISOCYANATE MODIFIED POLYESTER REINFORCING ELEMENTS AND RUBBER STRUCTURES MADE THEREFROM

Grover W. Rye, Cuyahoga Falls, and Roop S. Bhakuni and Joseph L. Cormany, Jr., Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

No Drawing. Filed June 14, 1968, Ser. No. 736,975
Int. Cl. C08d *11/04;* C08f *45/62;* C08g *39/10;* D02g *3/48*
U.S. Cl. 161—176 9 Claims

Relates to an improved rubber structure reinforced with an improved polyester reinforcing fiber modified with either an isocyanate or in combination with a polycarbonate present in the polyester prior to fiber formation.

3,563,850

ELECTRICAL INSULATION CONTAINING EPOXY RESIN, BIS(2,3-EPOXY-CYCLOPENTYL) ETHER AND RESORCINOL FORMALDEHYDE RESIN

Donald F. Stackhouse and Mark Markovitz, Schenectady, N.Y., assignors to General Electric Company, a corporation of New York

Continuation-in-part of application Ser. No. 603,247, Dec. 20, 1966. This application June 11, 1969, Ser. No. 834,224
Int. Cl. C08g *45/08*
U.S. Cl. 161—184 10 Claims

Electrical insulation treated with solventless resin compositions comprising (a) relatively slower curing bis(2,3-epoxycyclopentyl) ether, (b) other relatively faster curing 1,2 epoxy resin, and (c) resorcinol formaldehyde hardener is characterized by ready application and good electrical and physical properties.

3,563,851

WATER RESISTANT VINYL ACETATE COPOLYMER ADHESIVE COMPOSITIONS

Walter B. Armour, Plainfield, N.J., Albert I. Goldberg, Englefield Green, Surrey, England, and Victor Jasinski, South Plainfield, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 451,022, Apr. 26, 1965. This application Mar. 27, 1968, Ser. No. 716,368
Int. Cl. C08f *45/24;* B22b *27/30*
U.S. Cl. 161—251 3 Claims

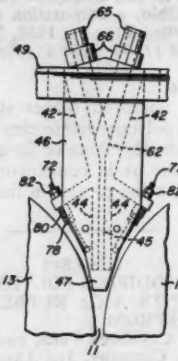
Adhesive compositions characterized by their outstanding water resistance, said compositions comprising a mixture of: (a) an aqueous emulsion of a vinyl acetate copolymer; (b) polyvinyl alcohol; and (c) an acidic metal salt curing agent.

3,563,852

HEADBOX FOR TWIN WIRE PAPER MAKING APPARATUS

Walter E. Rojecki, Watertown, N.Y., assignor to The Black Clawson Company, Hamilton, Ohio, a corporation of Ohio

Filed Aug. 11, 1967, Ser. No. 660,083
Int. Cl. D21f 1/02
U.S. Cl. 162—301 9 Claims



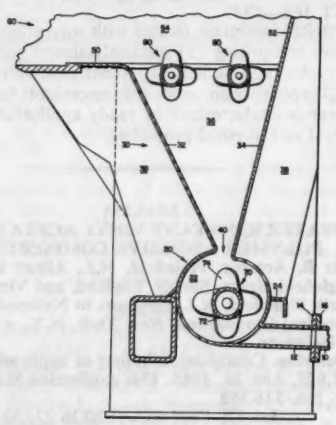
A headbox for use with a twin wire vertical paper making machine comprises a main body having therein two rows of downwardly extending stock inlet passageways which converge in an alternating manner into a high pressure blending chamber extending parallel to the nip, and spaced lip members defining a discharge slot leading from the blending chamber for directing a controlled stream of paper making stock downwardly into the forming zone at a velocity substantially equal to the speed of the wires.

3,563,853

STOCK DISTRIBUTOR

Albert Edward Harold Fair, 101 Monmouth St., Brookline, Mass. 02146

Filed Aug. 30, 1968, Ser. No. 756,576
Int. Cl. D21f 1/06
U.S. Cl. 162—342 1 Claim



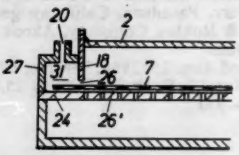
A flow control device disposed beneath and communicating directly with the headbox of a papermaking machine and including an inlet extending transversely of the entirety of the headbox width for receiving the flow of stock from a supply point, the inlet communicating with the bottom-most sector of an explosion chamber of generally circular cross section extending transversely of the entirety of the headbox width, with the top-most sector of the explosion chamber having an opening defining a constricted passageway leading into the bottom of a vertically-extending gradually-enlarging throat also extending transversely of the entirety of the headbox width and with the top of the throat communicating with an opening in the floor of the pond of the headbox, the explosion chamber containing a single rotatable homogenizer roll and the top-most portion of the throat containing a plurality of rotatable homogenizer rolls in a spaced side-by-side relationship.

3,563,854

SEALING ARRANGEMENT FOR A BREAST BOX OF A PAPERMAKING MACHINE

Henrik Nisser and Werner Schon, Heidenheim, Germany, assignors to J. M. Voith, G.m.b.H., Heidenheim (Brenz), Germany

Filed July 24, 1967, Ser. No. 655,597
Claims priority, application Germany, Aug. 6, 1966, P 15 11 247.7
Int. Cl. D21f 1/58
U.S. Cl. 162—353 5 Claims



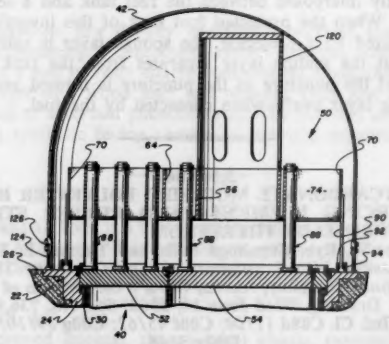
Sealing arrangement for sealing between the bottom edges of the walls of the breast box of a papermaking machine and the porous member moving therebeneath, in which the walls of the breast box terminate short of the porous member and chambers are formed along the walls to which a fluid medium is supplied under pressure to prevent suspension from flowing from the breast box out through the openings.

3,563,855

ENERGY ABSORBER STRUCTURE FOR A NUCLEAR POWER PLANT CONTAINMENT SYSTEM

Myroslaw Marko, Canoga Park, Calif., assignor to North American Rockwell Corporation

Filed Nov. 12, 1968, Ser. No. 774,755
Int. Cl. G21c 9/00
U.S. Cl. 176—38 11 Claims



The mechanical integrity of a nuclear power plant containment system is maintained by limiting the motion of

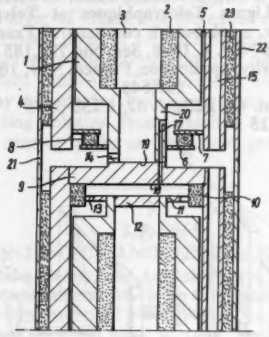
the top shield assembly of a nuclear reactor by an energy absorber structure that absorbs the energy imparted to the top shield assembly by a maximum accident in the reactor core which has an equivalent energy release of hundreds of pounds of TNT, and transmits the resulting force load directly to the reactor building structure.

3,563,856

THERMIONIC FUEL ROD WITH NUCLEAR FUEL

Franz Gross, Neckargemund, Alfred Jester, Speyer, Rudolf Krapf, Leimen, and Hubert Holick, Lampertheim, Germany, assignors to Brown, Boveri & Cie A.G., Mannheim-Kafertal, Germany, a German corporation

Filed Aug. 2, 1967, Ser. No. 657,820
Claims priority, application Germany, Aug. 5, 1966, B 88,345
Int. Cl. G21c *3/02*
U.S. Cl. 176—68 7 Claims



This invention relates to thermionic fuel elements, provided with nuclear fuel, for direct conversion into electrical energy of heat produced by nuclear fission. The thermionic elements comprise tubular, concentrically positioned emitters (1) and collectors (4). The fuel elements are electrically connected in series and are provided with respective discharge chambers (5) which are separated from each other by novel vacuum-tight seals, the seals providing a mechanical and electrical separation of the respective thermionic elements. The discharge chamber, provided at one end of each thermionic element, is filled with cesium vapor. The novel seal comprises a disc-shaped rigid metal-ceramic component (6, 7) at one end, and a pliable or yieldable metal-ceramic portion acting as a guide ring (10, 11) at the other end, acting in combination with a vacuum-tight plate (9).

3,563,857

PROCESS FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Toshikazu Oki, Fujisawa-shi, Yukio Nishimura, Yashiro-shi, Yoshio Sayama and Hisao Takemi, Yokohama-shi, Atsuo Kitai, Kamakura-shi, and Asaichiro Ozaki, Tokyo, Japan, assignors to Sanraku Ocean Co., Ltd., and Ajinomoto Co., Inc., both of Tokyo, Japan

No Drawing. Filed Mar. 15, 1968, Ser. No. 713,323
Claims priority, application Japan, Mar. 20, 1967, 42/17,002; Dec. 29, 1967, 43/84,433, 43/84,434; Jan. 18, 1968, 43/2,334
Int. Cl. C12b *3/00*
U.S. Cl. 195—49 10 Claims

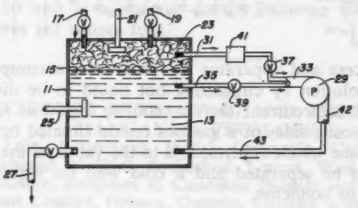
Many yeasts and bacteria are capable of growth on otherwise conventional culture media which contain ethanol as the principal source of carbon, and produce L-glutamic acid which may be recovered in commercially useful amounts. The medium should contain no more than 10% ethanol for good yields, and the ethanol content may be replenished by mixing the ethanol with the aeration gas.

3,563,858

AERATION AND FOAM CONTROL IN SPARGED FERMENTATION

George R. L. Worthington, Berkeley, Hyman Wolochow, Castro Valley, and Mark A. Chatigny, San Lorenzo, Calif., assignors, by mesne assignments, to the United States of America as represented by the Secretary of the Navy

Filed Sept. 27, 1967, Ser. No. 671,160
Int. Cl. B01d *19/02*; C12b *1/18*
U.S. Cl. 195—107 7 Claims



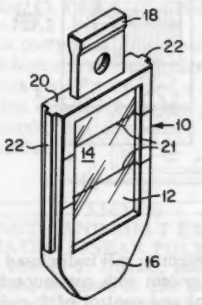
The method of controlling foam generated by the biological reaction of a fluid culture medium in a container wherein the inlet of a pump is connected to withdraw foam from the head space above the culture medium and to withdraw culture medium from the container. The pump compresses the withdrawn foam and intimately mixes the withdrawn foam, including the air and microbial mass contained therein, and the withdrawn medium. This compressed mixture of withdrawn foam and withdrawn culture medium is then reintroduced into the culture medium in the container thereby resulting in the intimate dispersion of the air, the microbial mass and the culture medium within the container.

3,563,859

DISPOSABLE CULTURE DEVICE

Aaron J. Fink, 614 Springer Terrace, Los Altos, Calif. 94022

Filed Oct. 16, 1967, Ser. No. 675,470
Int. Cl. C12b *1/00*; C12k *1/04, 1/10*
U.S. Cl. 195—140 7 Claims



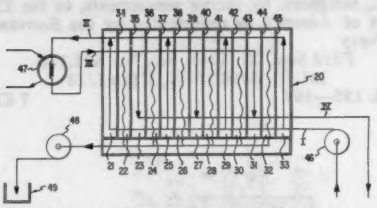
A disposable culture device for testing for the presence and number of bacteria utilizes a media support contained in an independent enclosure for incubation and bacteria colony growth.

3,563,860

EVAPORATION-CONDENSATION RECOVERY OF A SOLUTION COMPONENT USING VAPOR-PERMEABLE WALL SPACED FROM A COLD WALL

Yves Henderyckx, 35 Rue du Baillois, Bourgeois, Belgium

Filed Mar. 14, 1968, Ser. No. 713,073
Claims priority, application Belgium, Mar. 16, 1967, 41,134
Int. Cl. B01d *1/22*; C02 *1/06*
U.S. Cl. 202—172 6 Claims



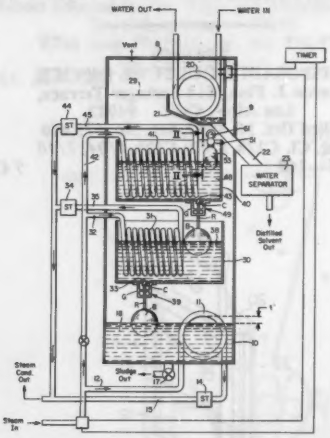
A process and apparatus for separating a component from a solution by circulating hot liquid to be distilled and, in countercurrent thereto, cooling liquid at respectively opposite sides of a gaseous region situated between a membrane which is permeable to the vapor of the component to be separated and a cold wall on which that vapor is to condense.

3,563,861

PLURAL STAGE DISTILLATION PROCESS WITH FOAM CONTROL

Calvert H. Fletcher, Bowling Green, Ky., assignor to Detrex Chemical Industries, Inc., Detroit, Mich., a corporation of Michigan

Continuation-in-part of application Ser. No. 623,409, Mar. 15, 1967, now Patent No. 3,417,001, Dec. 17, 1968. This application Aug. 19, 1968, Ser. No. 753,412
The portion of the term of the patent subsequent to Dec. 17, 1985, has been disclaimed
Int. Cl. B01b *1/02*; B01d *19/02*
U.S. Cl. 203—20 1 Claim



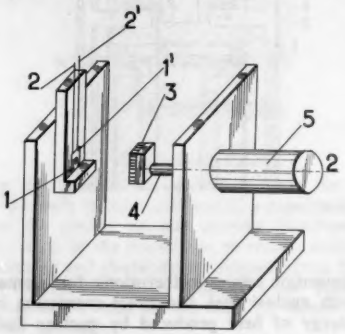
A distillation system or still is disclosed having a multilevel evaporation system with continuously self-adjusting liquid level control and control of foaming. The system has particular application to reclaim of solvent in dry cleaning system. At least one, and preferably two auxiliary evaporation pans are mounted one above the other within the vapor zone above the main boil chamber. The contaminated solvent liquid is fed to the upper auxiliary pan for at least partial evaporation of moisture, and the liquid is discharged from the bottom of the upper auxiliary pan to the lower auxiliary pan (where used) for further partial evaporation of moisture. Liquid is discharged through the bottom of the lower auxiliary pan to the main boil chamber. The auxiliary evaporator pans and the main boil chamber each contain steam coils. Float control valves are provided to control the liquid level in each vessel. The liquid levels in the auxiliary pans and in the main boil chamber are so controlled that each of the steam coils is only partially submerged in the liquid, with the exposed portions of the coils projecting above the liquid level to a limited extent such that the exposed portions are bathed in liquid by the agitation of boiling. This has been found to provide controlled bubbling out of moisture and foam agents.

3,563,862

HIGH PRECISION ANODIZING OF THIN FILMS

Jean Joly and Georges Dubois, Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France, a joint-stock company of France

Filed Nov. 4, 1968, Ser. No. 773,185
Claims priority, application France, Nov. 10, 1967, 127,648
Int. Cl. B23p *1/02*; C23b *5/48*
U.S. Cl. 204—15 4 Claims



To obtain high precision control of the anodization of thin metal films by measurement of the resistance of the said layer in the course of the operation, the measurement is performed on an electrolyte free surface.

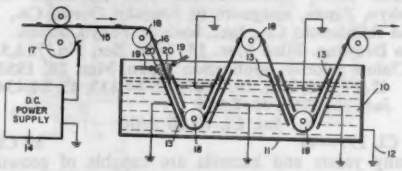
Anodization is carried through a movable arm carrying a pad filled with electrolyte the movement of which is synchronized with the A-C oxidising current. The film surface is dried when the pad is removed.

3,563,863

METHOD OF ANODIZING SINTERED TANTALUM POWDER ANODES

William F. Vierow, Carmel, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind., a corporation of Delaware

Filed May 16, 1967, Ser. No. 638,921
Int. Cl. C23b *5/58, 9/00*
U.S. Cl. 204—28 4 Claims



A process for continuously anodizing tantalum foil and sintered powdered pellets formed on the foil wherein the

foil passes through cathode plates immersed in an electrolyte bath and the full formation voltage is applied to the bath.

3,563,864

CHROMIUM-NICKEL PLATING

Arthur H. Du Rose, Euclid, Karl S. Willson, Cleveland, and Gustavo C. Tejada, Euclid, Ohio, assignors, by mesne assignments, to Kewanee Oil Company, Bryn Mawr, Pa., a corporation of Delaware

No Drawing. Filed Apr. 26, 1965, Ser. No. 451,028

Int. Cl. C23b *5/50, 5/52*

U.S. Cl. 204—37 **15 Claims**

This invention comprises a composite or laminated metallic coating, and a process for making such coating, comprising a first layer of nickel and an overlying layer of chromium, the laminate being cracked in a craze pattern in the range of 300 to 3000 cracks per lineal inch prepared by electrodepositing on a metal substrate a stressed layer of nickel and thereafter electrodepositing on this stressed layer of nickel a stressed layer of chromium adherent to the stressed layer of nickel and heating the resultant laminate. The stressing in the respective layers may be effected by means of an additive in the electroplating solution from which it is produced. The resultant crazing gives an improved protection against corrosion.

3,563,865

PRINTING OF ANODIZED ALUMINUM

Carl B. Blake, Bronx, and Adolph Fuerst, Brooklyn, N.Y., assignors to Martin Marietta Corporation, New York, N.Y., a corporation of Maryland

No Drawing. Filed Mar. 8, 1968, Ser. No. 711,505

Int. Cl. C23b *5/50*

U.S. Cl. 204—35 **6 Claims**

A process for decorating anodized aluminum including printing dry porous anodized surface by lithographic or gravure means with an ink containing a vaporizable colorant, heating for at least 30 seconds to intensify the print and sealing in a hot or boiling aqueous solution of a neutral salt.

3,563,866

ELECTRODEPOSITION OF NICKEL

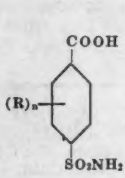
Richard J. Clauss, Allen Park, Norman C. Adamowicz, Inkster, and Robert A. Tremmel, Utica, Mich., assignors to The Udylite Corporation, Warren, Mich., a corporation of Michigan

No Drawing. Filed Dec. 26, 1968, Ser. No. 787,271

Int. Cl. C23b *5/08, 5/46*

U.S. Cl. 204—49 **12 Claims**

A method of electrodepositing satin-like finish nickel plates. The baths comprise otherwise standard nickel plating solutions but contain the combination of a polyalkylene glycol and a sulfonamide of the formula



wherein R is —CH_3, —C_2H_5, or OH and *n* is an integer from 0 to 3 inclusive.

3,563,867

ANODISING OF ALUMINIUM AND ITS ALLOYS

James M. Kape, West Molsey, and William Berwyn Hannaby, Wembley, England, assignors to Acorn Anodising Company Limited, London, England, a company of Great Britain

No Drawing. Filed Dec. 5, 1966, Ser. No. 598,966

Claims priority, application Great Britain, Dec. 9, 1965, 52,348/65

Int. Cl. C23b *9/02*

U.S. Cl. 204—58 **1 Claim**

A method of anodising aluminium and its alloys in an electrolyte comprising 3% to 30% by volume of an aqueous solution of sulphuric acid comprising adding between 0.1% and 2% by volume of nitric acid to the electrolyte before or during the carrying out of the anodising operation maintaining the electrolyte at a temperature between 0° C. and 25° C. and carrying out the anodising operation at an applied voltage between 10 and 60 and at a current density between 60 and 120 amperes per square foot.

3,563,868

PROCESS FOR EXTRACTING AND RECOVERING MANGANESE FROM ORES

Jan Leja, Vancouver, British Columbia, Canada, and Mahmud A. Qazi, Aminabad, Gujrat, West Pakistan, Pakistan, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada, a corporation of Canada

Filed Feb. 15, 1968, Ser. No. 705,741

Int. Cl. C22d *1/00*

U.S. Cl. 204—105 **10 Claims**

A process for extracting and recovering manganese from a low grade iron-manganese or in which the ore is dissolved by acid leaching, the leach solution is subjected to solvent extraction with di(2 - ethylhexyl) phosphoric acid dissolved in kerosene, the manganese extracted into the organic phase is stripped into a mixture of formamide and dimethyl formamide by hydrochloric acid and the formamide mixture containing $MnCl_2$ is subjected to electrolysis in a diaphragm cell to plate out metallic manganese.

3,563,869

IRRADIATED POLYETHYLENE

William C. Rainer, Baltimore, Md., Joseph J. Hitov, East Orange, N.J., Edward M. Redding, Baltimore, Md., and Arthur W. Sloan and William D. Stewart, Alexandria, Va., assignors, by mesne assignments, to W. R. Grace & Co., Cambridge, Mass., a corporation of Connecticut

Continuation-in-part of application Ser. No. 517,943, June 24, 1955, now Patent No. 3,097,150. This application Nov. 5, 1957, Ser. No. 694,662

Int. Cl. C08f *1/10;* **C08d** *3/04*

U.S. Cl. 204—159.2 **21 Claims**

1. A process comprising cross-linking polyethylene by the use of both high energy ionizing irradiation at a dosage of at least about 2×10^6 r.e.p. and a free radical polymerization catalyst selected from the group consisting of peroxy compounds, azo compounds and polynitrosodimethyl terephthalate.

3,563,870

MELT STRENGTH AND MELT EXTENSIBILITY OF IRRADIATED LINEAR POLYETHYLENE

Lu Ho Tung, Harold J. Donald, and Robert J. Caiola, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,541

Int. Cl. C08d *1/00, 3/04;* **C08f** *1/16*

U.S. Cl. 204—159.2 **5 Claims**

Melt strength and melt extensibility of linear polyethylene are improved by exposing said polyethylene to a small dose of high energy radiation.

3,563,871

PROCESS FOR REDUCING THE SURFACE FRICTION OF AN ELASTOMER USING RADIATION AND AN OXYGEN FREE ATMOSPHERE

Seymour Newman, Southfield, Robert A. Pett, Westland, and Robert W. Sanderson, Birmingham, Mich., assignors to Ford Motor Company, Dearborn, Mich., a corporation of Delaware

No Drawing. Filed Nov. 14, 1969, Ser. No. 877,044
Int. Cl. C08d 1/00; C08f 1/18
U.S. Cl. 204—159.14 5 Claims

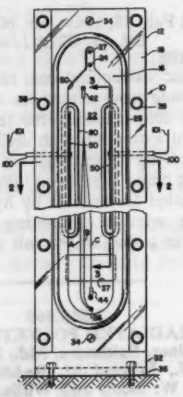
Polychloroprene rubber is formed into a desired shape and then treated with radiation having a wavelength between 2000 and 3500 angstroms. The resulting article has an extremely low coefficient of friction at the treated surface but retains its normal flexibility and hardness properties. Including small amounts of surfactant in compounding the rubber produces a still lower friction coefficient after radiation.

3,563,872

VOLTAGE GRADIENT CONTROL SYSTEM FOR ELECTROPHORESIS APPARATUS

Victor R. Huebner, Fullerton, Calif., assignor to Beckman Instruments, Inc., a corporation of California

Filed Aug. 28, 1968, Ser. No. 756,059
Int. Cl. B01k 5/00
U.S. Cl. 204—180 14 Claims



A system for regulating the magnitude of the electric potential gradient applied across the active electrophoresis area of an electrophoresis apparatus including an electrode disposed on either side of the active area for monitoring the electric potential gradient being applied across the active area, a differential amplifier for comparing the amplitude of a first signal derived by way of the electrodes with a reference signal to provide a second output signal having an amplitude which is a function of the difference between the amplitudes of the first output signal and the reference signal and means responsive to the second output signal for varying the magnitude of the electric potential gradient being applied across the active electrophoresis area.

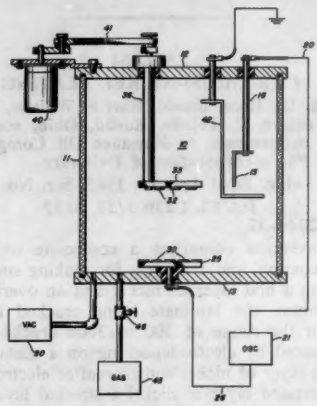
3,563,873

METHOD OF PRODUCING THIN TUNGSTEN-SILICON RESISTOR FILMS

Donald S. Beyer, Scottsdale, Ariz., assignor to Dickson Electronics Corporation, a corporation of Arizona

Filed June 28, 1968, Ser. No. 741,076
Int. Cl. C23c 15/00
U.S. Cl. 204—192 6 Claims

The production of thin films on a substrate is effected by sputtering the film on the substrate; sputtering is achieved by subjecting a tungsten-silicon target to ionic bombardment. The ionizing bombardment is achieved in



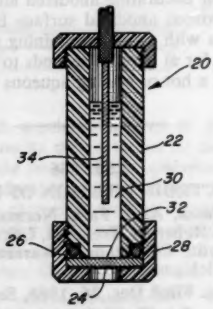
an argon atmosphere by impressing a RF potential between the target and an aluminum electrode; a grounded aluminum shield shrouds the aluminum electrode.

3,563,874

HALIDE-SENSITIVE ELECTROCHEMICAL ELECTRODES AND METHOD OF MAKING SAME

James W. Ross and Martin S. Frant, Newton, and John H. Riseman, Cambridge, Mass., assignors to Orion Research Incorporated, Cambridge, Mass., a corporation of Massachusetts

Filed Oct. 2, 1967, Ser. No. 672,152
Int. Cl. G01n 27/54
U.S. Cl. 204—195 16 Claims



An electrode sensitive to chloride ions in solution, the ion-sensitive portion being an imporous membrane of silver sulfide and silver chloride. The electrode is prepared by coprecipitating the silver salts, and after washing and drying, compressing the coprecipitate, under vacuum conditions, into a dense, imporous pellet. Bromide and iodide sensitive electrodes are prepared in substantially the same manner from silver sulfide and the corresponding silver halide.

3,563,875

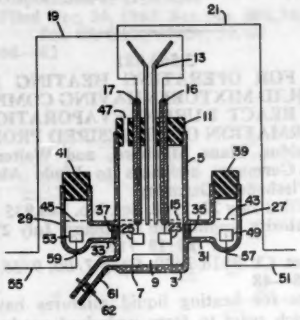
APPARATUS FOR COULOMETRIC TITRATION

Dale M. Coulson, 884 Colorado Ave., Palo Alto, Calif. 94303

Filed Apr. 2, 1968, Ser. No. 718,100
Int. Cl. G01n 27/44
U.S. Cl. 204—195 3 Claims

Apparatus and method for semi-automatic coulometric titration by continuously monitoring a potential of a

sensor electrode in an electrolytic solution into which a reactant is introduced, adding a predetermined amount of titrant when the potential reaches a preselected value and

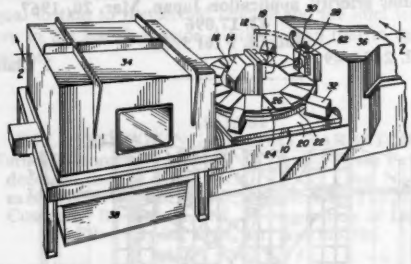


preventing incomplete addition of titrant by superimposing at regular intervals a negative wave pulse onto the potential being monitored.

3,563,876
ELECTROCHEMICAL MACHINING APPARATUS HAVING RAM MEANS

Leonard R. Malkowski, La Grange, and Sigmund H. Bielak, Downers Grove, Ill., assignors to Anocut Engineering Company, a corporation of Illinois

Filed Aug. 27, 1968, Ser. No. 755,561
Int. Cl. C23b *5/68, 1/00;* **B01k** *3/00*
U.S. Cl. 204—212 **12 Claims**

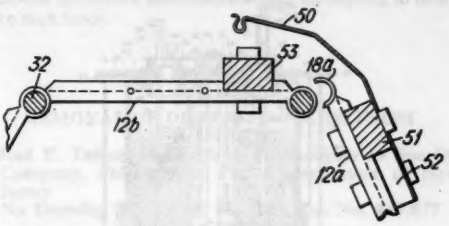


An apparatus used in electrochemical machining which comprises a rotatable table for carrying a workpiece, the table being also movable in a horizontal direction. A first electrically conductive member is mounted in a position adjacent the workpiece, the latter being carried on the table. A horizontal ram is provided to carry a second electrically conductive member, which can be moved by the ram into adjacent relation with the first electrically conductive member. The apparatus is typically used by securing a cylindrical or other hollow workpiece to the table with the first electrically conductive member being held in the interior of the hollow workpiece. One of the electrically conductive members is brought into contact with the workpiece. A stream of pressurized liquid is passed between the other conductive member and the workpiece, the conductive members being urged toward each other by the ram, while direct electric current is passed between the members and through the workpiece and stream of electrolyte in a sense to make the workpiece anodic relative to the conductive member separated from it by the stream of electrolyte.

3,563,877
ELECTRO-PLATING BARRELS

Alan Carmichael, Brookwood, England, assignor to Electro-Chemical Engineering Company Ltd., Sheerwater, Woking, Surrey, England, a British company

Filed Sept. 11, 1967, Ser. No. 666,820
Claims priority, application Great Britain, Sept. 14, 1966, 41,036/66
Int. Cl. C23b *5/78*
U.S. Cl. 204—213 **7 Claims**

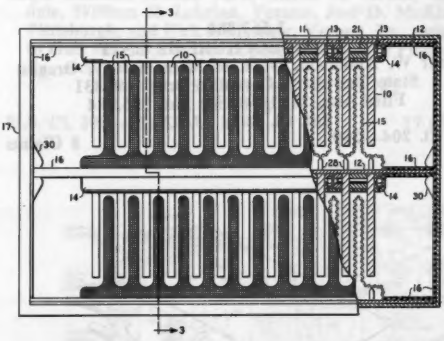


The invention provides an electro-plating barrel, and elements therefor, the perforated plastic elements having hinge lugs on opposite parallel sides, which interfit hinge lugs on the other sides of adjacent identical elements in a polygonal array, the elements being assembled by rods passing through the lugs.

3,563,878
ELECTROLYTIC CELLSTRUCTURE

Morris P. Grotheer, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y., a corporation of New York

Filed July 5, 1968, Ser. No. 742,892
Int. Cl. C22d *1/02*
U.S. Cl. 204—256 **9 Claims**



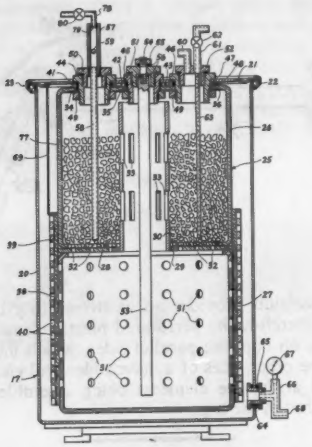
The anodes of diaphragm type electrolytic cells of either monopolar or bipolar design are secured to spacer bars, which are attached to a base plate, with bolts running parallel to the base plate through pressure bars on both sides of the anodes. One pressure bar is threaded to receive the threads of the bolt, while the other pressure bar is drilled and countersunk to receive the head of the bolt. The bolted anode assembly provides a low resistance joint which permits operation of an electrolytic cell at higher current densities without encountering excessive voltages. Furthermore, the anodes may be shorter in the bolted assembly because less stub loss is involved than in the conventional cast lead base covered with mastic.

3,563,879

ELECTROLYTIC CHLORINE GENERATOR

Joseph M. Richards, 2819 E. 49th St., Tulsa, Okla. 74105, and William R. Rabson, 7 Asbury Place, Houston, Tex. 77007

Filed Mar. 8, 1967, Ser. No. 621,545
Int. Cl. B01k *3/00*
U.S. Cl. 204—272 **3 Claims**



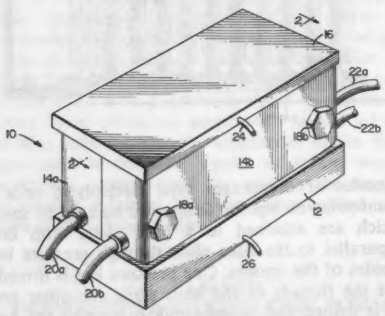
An electrolytic chlorine generator operating on the well known principle of electrolysis of a solution of a metallic chloride salt, builds up its own internal pressure and discharges chlorine into a flowing stream.

3,563,880

GEL ELECTROPHORESIS UNIT

Arthur W. Anderson, Dept. of Microbiology, Oregon State University, Corvallis, Oreg. 97331

Filed Aug. 28, 1968, Ser. No. 755,884
Int. Cl. B01d *13/02*
U.S. Cl. 204—299 **8 Claims**



A gel electrophoresis cell having upper and lower buffer solution chambers containing oppositely charged electrodes. A gel containing slot extends between the chambers and coolant chambers are disposed on either side of the slot to control the temperature of the gel. The structure surrounding the slot is composed of mirror image members which mate on the plane of the slot in such a manner that, upon disassembly, the gel contained in the slot is presented for ready accessibility and removal of the gel.

3,563,881

PROCESS FOR OPERATING HEATING DEVICES FOR LIQUID MIXTURES HAVING COMPONENTS WHICH REACT DURING EVAPORATION WITH THE FORMATION OF UNDESIRED PRODUCTS

Herbert Baldus, Hans Manhard, and Walter Kreuter, Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed July 23, 1968, Ser. No. 746,935
Claims priority, application Germany, July 27, 1967, P 16 19 717.4
Int. Cl. B01d *1/00;* **C10g** *7/00, 9/16*
U.S. Cl. 208—48 **10 Claims**

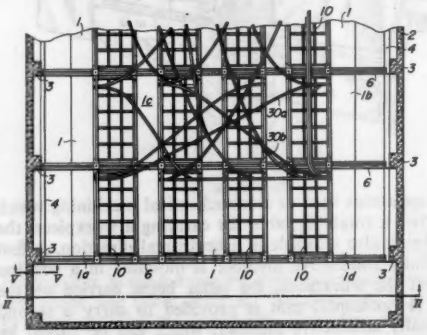
A process for heating liquid mixtures having components which react to form undesired products during heating. The mixture is heated by application of heat through heating surfaces in contact with the liquid mixture. The temperature of the heating surfaces is maintained at a predetermined differential relative to the boiling point of the mixture, to limit the production of undesired products to a minimum during heating.

3,563,882

SYSTEM AND METHOD FOR LAYING ELECTRIC CABLES BETWEEN A NUMBER OF ELECTRIC EQUIPMENTS

Ryoichi Kimura, Yokohama, Kiyomi Omatsuzawa, Kamakura-shi, Yasuyuki Tanaka and Hiroshi Yoshikawa, Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan, a corporation of Japan

Filed Mar. 18, 1968, Ser. No. 713,851
Claims priority, application Japan, Mar. 20, 1967, 42/17,096
Int. Cl. F16l *3/00*
U.S. Cl. 248—49 **1 Claim**

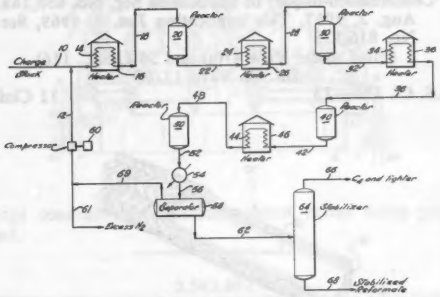


A system for laying electric cables between a number of pieces of electric equipment constituting a large electrical installation, which utilizes a number of cable racks having a unit area secured to beams which are provided over said pieces of electric equipment to support said equipment, advantages of said system being that said cable racks can be pre-fabricated in workshops and that said cables can be laid by approximately straight route, thereby bringing about considerable savings in time, labor and material; and a method for laying cables using such a system.

3,563,883
CATALYTIC REFORMING

Albert J. Westby, Port Arthur, Luther F. Champion, Houston, and William D. White and Leland A. Chvatal, Port Arthur, Tex., assignors to Texaco Inc., New York, N.Y., a corporation of Delaware

Filed Dec. 30, 1968, Ser. No. 806,766
Int. Cl. C10g *35/04, 39/00*
U.S. Cl. 208—63 **4 Claims**

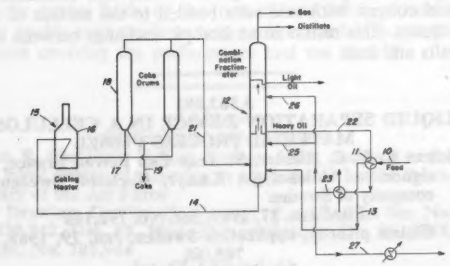


Improvements in catalytic reforming of hydrocarbons boiling in the gasoline range are achieved by operating a multireactor reforming process with the reactor inlet temperature profile having a "V-shaped" configuration. The temperature of the reaction mixture at the inlet to the second reactor is lower than at the inlet to the first reactor and in a three reactor unit, the inlet temperature to the third reactor is higher than that of the second reactor. Where a fourth reactor is utilized, the inlet temperature to the third reactor may be higher, lower or equal to that to the second reactor and the inlet temperature to the fourth reactor is higher than that to the third reactor.

3,563,884
DELAYED COKING OF COAL TAR PITCHES

Ward J. Bloomer, Westfield, N.J., and William P. Brison, deceased, late of Glen Rock, N.J., by Ethel N. Brison, executrix, Glen Rock, N.J., assignors to The Lummus Company, Bloomfield, N.J., a corporation of Delaware

Filed July 15, 1968, Ser. No. 746,706
Int. Cl. C10g *9/14*
U.S. Cl. 208—81 **4 Claims**



Process for the delayed coking of a liquid feed or a fraction thereof having a high content of condensed ring aromatic compounds and an initial boiling point of not less than 600° F., wherein the unit is operated at a coking heater temperature of 900°–960° F., a coke drum overhead temperature of 840° F.–900° F., and pressure of 15–90 p.s.i.g. and the coker combination fractionator is operated at a temperature and pressure to recover a heavy oil having an initial boiling point of 600° F.–750° F. The recycle of a portion of the overhead from the coking drums introduced into the fractionator is at a volumetric rate of 0.3–0.6:1, based on equivalent feed introduced into the coking heater. Operation of the delayed coking unit under the above conditions prevents the runaway reactions heretofore encountered when attempting to delay coke such feeds.

3,563,885
REMOVAL OF DISPERSED SOLIDS FROM A LIQUID

Alfred F. Talbot, Wallingford, Pa., assignor to Sun Oil Company, Philadelphia, Pa., a corporation of New Jersey

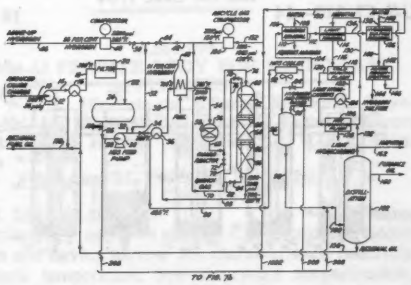
No Drawing. Filed Aug. 13, 1969, Ser. No. 849,877
Int. Cl. C10m *11/00*
U.S. Cl. 208—180 **7 Claims**

Dispersed solids can be efficiently removed from an organic liquid by adding a small quantity of ultra high molecular weight polyethylene to the liquid containing the dispersed solids. This polyethylene has a weight average molecular weight in the range of 500,000 to 6,000,000. The resulting mixture of liquid, dispersed solids and the polyethylene is agitated at an elevated temperature until the polyethylene goes into solution. Afterwards the mixture is allowed to cool and coagulation occurs. The coagulated material comprising dispersed solids and the polyethylene can be simply removed by known techniques.

3,563,886
ASPHALTENE HYDRODESULFURIZATION WITH SMALL CATALYST PARTICLES IN A PARALLEL REACTOR SYSTEM

Edgar Carlson, Allison Park, Alfred M. Henke, Springdale, William R. Lehrian, Verona, Joel D. McKinney, Pittsburgh, and Kirk J. Metzger, Verona, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa., a corporation of Delaware

Filed Oct. 25, 1968, Ser. No. 770,725
Int. Cl. C10g *23/02*
U.S. Cl. 208—216 **17 Claims**



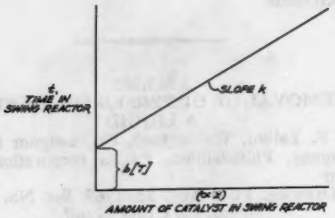
The hydrodesulfurization of a crude oil or a reduced crude containing the asphaltene fraction proceeds at unexepectedly low temperatures by utilizing a Group VI and Group VIII metal containing catalyst on alumina when the catalyst particles are very small and have a diameter between about 1/20 and 1/40 inch and are disposed in a parallel catalyst bed system.

3,563,887

ASPHALTENE HYDRODESULFURIZATION WITH SMALL CATALYST PARTICLES DISPOSED IN A GUARD CHAMBER-MAIN REACTOR SYSTEM

Malcolm D. Fraser and Allen E. Somers, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa., a corporation of Delaware

Filed Oct. 25, 1968, Ser. No. 770,726
Int. Cl. C10g 23/02
U.S. Cl. 208—216 13 Claims



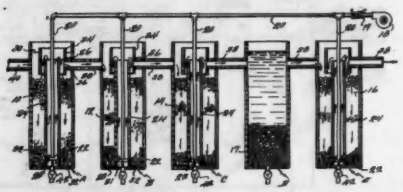
The hydrodesulfurization of a crude oil or a reduced crude containing the asphaltene fraction proceeds at unexpectedly low temperatures by utilizing a supported Group VI and Group VIII metal-containing hydrodesulfurization catalyst when the catalyst particles are very small and have a diameter between about 1/20 and 1/40 inch and when the catalyst is disposed in a guard chamber-main reactor system. The apportioning of the total catalyst between the guard chamber and the main reactor and the frequency of renewal of the guard chamber are established according to the disclosed equations to minimize the pressure drop across the catalyst by maintaining on stream at a given time a minimum proportion of the total catalyst. The equations have particular applicability to the hydrodesulfurization process but they can also be applied to other processes.

3,563,888

METHOD AND APPARATUS FOR TREATING WASTE-CONTAINING LIQUOR

John W. Klock, Tempe, Ariz., assignor to Research Corporation, New York, N.Y., a nonprofit New York corporation

Filed Aug. 21, 1968, Ser. No. 754,341
Int. Cl. C02c 1/04
U.S. Cl. 210—14 16 Claims



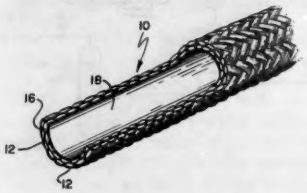
Waste-containing liquor is biochemically treated by continuously recirculating it through a sand-gravel filter media which is submerged in the liquor while continuously withdrawing a small portion of said liquor. A pressurized column of oxygen-containing fluid entrains and lifts the liquid waste through an unobstructed tube and recirculates it downwardly through the filter media. During the lifting process oxygen from the fluid permeates the waste in order to ensure active aerobic metabolism. The treated effluent is directed to a storage area, or preferably it is conveyed to another tank for further treatment.

3,563,889

INTEGRAL SEMIPERMEABLE MEMBRANE AND BRAIDED SUPPORT TUBE

William W. Cooper IV, Sudbury, and Russell W. Pierce, Hanover, Mass., assignors to Abcor, Inc., Cambridge, Mass., a corporation of Massachusetts

Continuation-in-part of application Ser. No. 658,168, Aug. 2, 1967. This application Jan. 3, 1969, Ser. No. 816,133
(Filed under Rule 47(a) and 35 U.S.C. 116)
Int. Cl. B01d 13/00
U.S. Cl. 210—23 11 Claims



An integrally supported semipermeable membrane is composed of a tubular braided fabric impregnated with a polymeric film forming composition, and carries on at least one surface a layer of the polymer with the surface of the polymer carrying an active layer which provides the separation characteristics of the membrane.

3,563,890

PROCESS AND MATERIAL FOR EXTRACTING DISSOLVED RADIOACTIVE IONS FROM LIQUIDS

Horst Willi Perl, Walter Fritz Rittner, and Oskar Max Glemser, Goettingen, Germany, assignors to Sartorius-Membranfilter G.m.b.H., Goettingen, Germany

No Drawing. Filed July 10, 1967, Ser. No. 651,977
Claims priority, application Germany, July 11, 1966, S 104,735
Int. Cl. B01d 15/04
U.S. Cl. 210—38 6 Claims

Microcrystalline, difficultly soluble salts, which are isotopic with radioactive ions, are formed by precipitation on the surface of a support in an agitated liquid suspension of the support. A liquid in which said radioactive ions are dissolved is passed through a column and contacted in said column with said salts bonded to the surface of the support. This results in an isotopic exchange between said salts and ions.

3,563,891

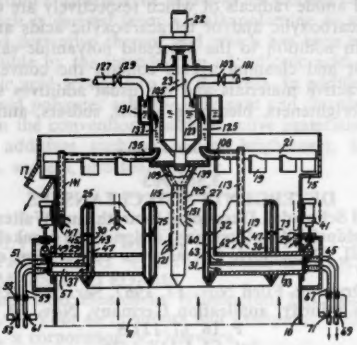
LIQUID SEPARATION DEVICE IN A CELLULOSIC MATERIAL PROCESS VESSEL

Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Aktiebolaget Kamyr, Karlstad, Sweden, a company of Sweden

Filed Jan. 17, 1969, Ser. No. 792,108
Claims priority, application Sweden, Jan. 19, 1968, 705/68
Int. Cl. B01d 29/42
U.S. Cl. 210—315 8 Claims

Apparatus for removing liquid from cellulosic pulp suspensions comprising a cylindrical container through which the suspension is axially moved and liquid withdrawal means comprising a set of hollow screen bodies arranged concentrically in the container and having cylindrical screen faces through which the liquid is with-

drawn for discharge. Discharge of liquid from the various screen faces is separately controlled, a number of discharge conduits and exterior control valves being provided.



3,563,892

TEXTILE-TREATING COMPOSITION AND PROCESS

No Drawing. Filed June 12, 1967, Ser. No. 645,507
Leigh William Cooley, Greenville, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Int. Cl. D06m 5/00
U.S. Cl. 252—8.7 3 Claims

A novel composition of a major portion of coconut oil and minor portions of (a) the sodium salt of sulfated glyceryl trioleate, (b) a condensate of 1 mol of nonylphenol with 5.5 mols of ethylene oxide, and (c) a mixture of mono- and diglycerides of oleic acid is formulated and used as an excellent lubricant for polyester filaments during the drawing operation. This composition is also utilized on the filaments with an additional overlay finish composition.

3,563,893

CHEMICAL COMPOSITION

George L. Doelling, St. Louis, Mo., and James E. Peskar, Cahokia, and Joseph A. Siefker, Quincy, Ill., assignors to Wager Electric Corporation, Newark, N.J., a corporation of Delaware
No Drawing. Filed Jan. 8, 1968, Ser. No. 696,120

Int. Cl. C09k 3/00
U.S. Cl. 252—73 9 Claims

Acetals are prepared by reacting methoxyacetaldehyde with tetrahydrofurfuryl alcohol or with mono lower alkyl ethers of mono, di or tri ethylene or propylene glycols. These acetals have value as essential ingredients in hydraulic brake fluids of the non-mineral oil type, since they enable such fluids to better meet mandatory specifications covering the performance and use thereof.

3,563,894

GREASE COMPOSITION

John B. Christian, Yellow Springs, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force
No Drawing. Continuation-in-part of application Ser. No. 420,842, Dec. 23, 1964. This application Feb. 16, 1968, Ser. No. 705,944

Int. Cl. C10m 7/50
U.S. Cl. 252—25 2 Claims

A grease formulation capable of maintaining its dimensional stability under heavy load and high temperature conditions consisting of (1) a major proportion of trifluoropropylmethylsiloxane having a viscosity of 300 centistokes and consisting essentially of

$$CF_3CH_2CH_2Si(CH_3)O$$

units and endblocking units of the formula $(CH_3)2SiO_5$; (2) a minor proportion by weight of a composition consisting of (a) 50–55% by weight of bitolylene diisocyanate, (b) 20–30% by weight of p-chloraniline, and (c) 20–25% by weight of p-toluidine; and (3) 10% by weight of molybdenum disulfide.

3,563,895

LUBRICANT-COOLANT

Vladimir Janatka, Woodbury, and Eugene P. Kirwan, Wolcott, Conn., assignors to Valgene Industrial Research Corporation, Wolcott, Conn., a corporation of Connecticut
No Drawing. Filed Oct. 25, 1968, Ser. No. 770,862

Int. Cl. C10m 1/28
U.S. Cl. 252—34.7 6 Claims

Water soluble polyacrylamide polymers neutralized with an ethylene-maleic anhydride copolymer have been found extremely effective as a combined lubricant-coolant when used in aqueous solutions in metal working operations.

3,563,896

PROCESS FOR ALKYLATING VINYL AROMATIC HYDROCARBON POLYMERS AND MAKING LUBRICATING OIL VISCOSITY IMPROVERS

Robert H. Allen, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware
No Drawing. Filed Jan. 15, 1968, Ser. No. 697,590

Int. Cl. C10m 1/18
U.S. Cl. 252—59 5 Claims

The invention concerns a process for alkylating vinyl aromatic polymers to form oil soluble products suitable for use as viscosity index improver for lubricating oils.

3,563,897

FERROMAGNETIC GARNET WITH STRESS INSENSITIVE B–H LOOP AND METHOD OF MAKING SAME

Russell G. West, Alexandria, Va. (% Trans-Tech, Inc., 12 Meem Ave., Gaithersburg, Md. 20760)
Filed Apr. 3, 1968, Ser. No. 718,536
Int. Cl. C04b 35/40
U.S. Cl. 252—62.57 11 Claims

Yttrium iron garnet ferrites, wherein the introduction of cerium oxide into the garnet reduces the mechanical pressure stress dependence of remanent magnetization and coercive force, are disclosed.

3,563,898

Mg-Mn-Al FERRITE BODY FOR MICROWAVE APPLICATION

Yutaka Neichi, Hirakata-shi, Minoru Sugimura, Neyagawa-shi, and Eiichi Hirota, Sakai-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 22, 1967, Ser. No. 662,520
Int. Cl. C04b 35/26
U.S. Cl. 252—62.58 2 Claims

A ferrite body useful in making e.g. microwave circuit elements and having narrow ΔH characteristics, relatively high Curie temperature, low saturation magnetization, small coercive force and good squareness ratio is constituted by a Mg-Mn-Al ferrite composition with a porosity less than 2% and an average grain size of 0.5 to 20μ or 100 to 500μ. Optimal compositions comprise MgO 45 to 50 mol percent, Fe_2O_3 35 to 45 mol percent, Al_2O_3 5 to 15 mol percent and MnO 0.1 to 7.0 mol percent. Improved ΔH is achieved by the additional presence of 0.1 to 5 wt. percent of Y_2O_3, ZrO_2 or Bi_2O_3 or 0.1 to 5 wt. percent of additional MgO. A "site ratio" of Mg ions from 0.5 to 0.2 is desirable.

3,563,899
PERMANENT MAGNET MATERIAL HAVING STRONTIUM FERRITE BASE
Roger Frank Coe, Rednal, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
No Drawing. Filed May 29, 1968, Ser. No. 732,880
Claims priority, application Great Britain, June 2, 1967, 25,592/67
Int. Cl. C04b *35/26;* **H01f** *1/10*
U.S. Cl. 252—62.63 **3 Claims**

Up to 3% by weight of strontium phosphate is added to permanent magnet material of known form having a strontium ferrite base. The addition of the strontium phosphate is found to give considerably improved magnetic properties.

3,563,900
PAINT STRIPPING COMPOSITION AND METHOD
Donald P. Murphy, Roseville, Mich., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y., a corporation of New York
No Drawing. Filed Oct. 27, 1967, Ser. No. 678,524
Int. Cl. C11d *7/12, 7/14, 7/16*
U.S. Cl. 252—135 **12 Claims**

A composition useful in removing paint and similar protective coating from a substrate which comprises an aqueous dispersion of beta-naphthol, said dispersion containing both dissolved and undissolved beta-naphthol. The aqueous dispersion may be either, acid, neutral or mildly alkaline and in the latter instance may contain mildly alkaline materials such as sodium tetraborate, sodium metasilicate, disodium phosphate, and the like. The composition is particularly useful in removing alkyd and acrylic type paints from aluminum, as it effects rapid removal of these coatings without attack on the aluminum.

3,563,901
RINSE AID COMPOSITIONS
Homer E. Crotty, Cincinnati, Ohio, assignor to W. R. Grace & Co., New York, N.Y., a corporation of Connecticut
No Drawing. Continuation of application Ser. No. 571,989, Aug. 12, 1966. This application Feb. 26, 1970, Ser. No. 18,016
Int. Cl. C11d *3/04*
U.S. Cl. 252—136 **8 Claims**

The invention disclosed is directed to a rinse aid for use in mechanical dishwashing machines and includes prescribed amounts of an alkali metal or ammonium salt of an alcohol sulfate of the formula $ROSO_3H$ where R is an alkyl group having about 5 to 9 carbon atoms, and prescribed amounts of a defined nonionic surfactant. The rinse aid may further include materials such as defoaming agents, solvents, ingredients to precipitate hard water salts, and the like.

3,563,902
DETERGENTS AND CLEANSERS
Edmund Schmadel, Dusseldorf-Benrath, and Walter Kling, Dusseldorf-Eller, Germany, assignors to Henkel & Cie, G.m.b.H., Dusseldorf, Germany, a corporation of Germany
No Drawing. Filed Nov. 17, 1967, Ser. No. 683,769
Claims priority, application Germany, Nov. 19, 1966, P 16 17 121.4
Int. Cl. C11d *3/32*
U.S. Cl. 252—152 **3 Claims**

Novel detergent and cleansing agents are disclosed characterized by their ability to inhibit the graying of textile articles which takes place in laundering. In particular, the novel detergent and cleaning agents are effective to prevent the graying of textile articles prepared at least in part with synthetic fibers.

The detergent and cleaning agents of the invention are characterized by a content of 0.1 to 20 wt.-percent referred to the total composition of at least one water soluble salt of a free carboxyl group containing polyamide, the acid and amide radicals of which respectively are derived from tricarboxylic and/or tetracarboxylic acids and diamines. In addition to the aforesaid polyamide salts, the detergent and cleaning agents contain the conventional surface active materials and the usual additives such as optical brighteners, bleaching agents, sudsers, anti-foamers, etc.

3,563,903
DETERGENTS AND CLEANSERS
Edmund Schmadel, Dusseldorf-Benrath, and Walter Kling, Dusseldorf-Eller, Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany, a corporation of Germany
No Drawing. Filed Nov. 17, 1967, Ser. No. 683,778
Claims priority, application Germany, Nov. 19, 1966, P 16 17 122.5
Int. Cl. C11d *3/26*
U.S. Cl. 252—152 **3 Claims**

Novel detergent and cleansing agents are disclosed characterized by their ability to inhibit the graying of textile articles which takes place in laundering. In particular the novel detergent and cleansing agents are effective to prevent the graying of textile articles prepared at least in part with synthetic fibers.

The detergent and cleansing agents of the invention are characterized by a content of 0.1 to 20 wt. percent referred to the total composition of at least one water soluble salt of a free carboxyl group containing polyester, the acid and alcohol radicals of which respectively are derived from tricarboxylic and/or tetracarboxylic acids and bivalent alcohols. In addition to the aforesaid polyester salts the detergent and cleaning agents contain the conventional surface active materials and the usual additives such as optical brighteners, bleaching agents, sudsers, anti-foamers, etc.

3,563,904
DETERGENTS AND CLEANSERS
Edmund Schmadel, Dusseldorf-Benrath, and Walter Kling, Dusseldorf-Eller, Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany, a corporation of Germany
No Drawing. Filed Nov. 17, 1967, Ser. No. 683,779
Claims priority, application Germany, Dec. 14, 1966, H 61,276
Int. Cl. C11d *3/24, 3/26*
U.S. Cl. 252—152 **3 Claims**

Novel detergent and cleansing agents are disclosed characterized by their ability to inhibit the graying of textile articles which takes place in laundering. In particular the novel detergent and cleaning agents are effective to prevent the graying of textile articles prepared at least in part with synthetic fibers.

3,563,905
DETERGENTS AND CLEANSERS
Edmund Schmadel, Dusseldorf-Benrath, and Walter Kling, Dusseldorf-Eller, Germany, assignors to Henkel & Cie, G.m.b.H., Dusseldorf-Holthausen, Germany, a corporation of Germany
No Drawing. Filed Nov. 17, 1967, Ser. No. 683,834
Claims priority, application Germany, Nov. 18, 1966, P 16 17 120.3
Int. Cl. C11d *3/24, 3/26*
U.S. Cl. 252—152 **3 Claims**

Novel detergent and cleansing agents are disclosed characterized by their ability to inhibit the graying of textile articles which takes place in laundering. In particular the novel detergent and cleaning agents are effective to prevent the graying of textile articles prepared at least in part with synthetic fibers.

The detergent and cleaning agents of the invention are characterized by a content of 0.1 to 20 wt. percent re-

ferred to the total composition of at least one water soluble salt of a polyester, the acid radicals of which are derived from a dicarboxylic acid and the alcohol component of which is derived from a dialkanolamine or an N-substituted derivative thereof and which has been made water-soluble by the introduction of sulfonic acid or alkylsulfonic acid groups into the molecule. In addition to the aforesaid polyester salts the detergent and cleaning agents contain the conventional surface active materials and the usual additives such as optical brighteners, bleaching agents, sudsers, anti-foamers, etc.

3,563,906

POLYAMINE CURING AGENTS FOR USE IN PREPARING POLYURETHANE ELASTOMERS AND FOAMS

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 668,961, Sept. 19, 1967, which is a continuation-in-part of application Ser. No. 631,868, Apr. 19, 1967, which in turn is a continuation-in-part of application Ser. No. 552,704, May 25, 1966, which are all now abandoned. This application Dec. 4, 1968, Ser. No. 781,276

Int. Cl. C09k *3/00;* **C08g** *22/00, 22/44*

U.S. Cl. 252—182 **10 Claims**

Amine curing agents for liquid isocyanato-terminated polyurethanes obtained by condensing a monoamine composition with formaldehyde in the presence of a mineral acid. The monoamine can be 2-chloroaniline or mixtures of 2-chloroaniline with aniline and/or o-toluidine. The proportions of reactants are selected to produce curing agents which have moderate reactivities and exhibit a limited tendency to crystallized under normal operation conditions. The amine compositions are particularly useful as curing agents in the preparation of polyurethane foams. The new compounds, 3-chloro-4,4′-diaminodiphenylmethane and 3-chloro-3′-methyl-4,4′-diaminodiphenylmethane can be obtained from appropriate reaction products.

3,563,907

STORAGE STABLE LIQUID COMPOSITIONS USEFUL AS CURATIVES

Herbert G. Nadeau, North Haven, and Paul H. Waszeciak, Guilford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich., a corporation of Delaware

No Drawing. Filed Nov. 17, 1967, Ser. No. 684,484

Int. Cl. C09k *3/00;* **C08g** *33/14*

U.S. Cl. 252—182 **5 Claims**

Novel storage stable liquid compositions are prepared by admixing two normally solid primary polyamines; namely, methylene polyphenyl polyamines and hexamethylene diamine. The mixture of polyamines remains liquid at temperatures above 5° C. The novel mixtures of polyamines can be used as epoxy resin curatives, polyurethane extenders and for all purposes for which the individual components are conventionally employed.

3,563,908

VISCOSITY-STABILIZED FOAM PRECURSORS AND PROCESS

Fred W. Koenig, Highland, and Stanley T. Kus, Griffith, Ind., and Sheldon Howard Marcus, Skokie, Ill., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 420,801, Dec. 23, 1964. This application Dec. 22, 1967, Ser. No. 692,719

Int. Cl. C08g *22/44;* **C09k** *3/00*

U.S. Cl. 252—182 **5 Claims**

Stabilized liquid non-polymeric foam precursors are produced when fluorine substituted alkanes boiling above 60° F. are added to a liquid non-polymeric foam precursor prepared by mixing a polyfunctional aromatic carboxylic acid derivative with a liquid polyarylpolyisocyanate. These foam precursors are reacted with a polyol having a molecular weight below 2,000 and containing at least three hydroxyl groups. The resulting foams produced are useful for insulation of walls, for fireproofing buildings and the like.

3,563,909

METHOD OF PREPARING A LANTHANIDE ACTIVATED YTTRIUM, GADOLINIUM OR LANTHANUM OXYSULFIDE LUMINESCENT MATERIAL

Roelof Egbert Schuil, Johannes Aloysius Maria Dikhoff, and Dirk Barneveld, Emmasingel, Eindhoven, Netherlands, assignors, by mesne assignments, to U.S. Philips Corporation, New York, N.Y., a corporation of Delaware

Filed Mar. 29, 1968, Ser. No. 717,259

Claims priority, application Netherlands, July 1, 1967, 6709191

Int. Cl. C09k *1/14*

U.S. Cl. 252—301.4 **6 Claims**

A yttrium, gadolinium or lanthanum oxysulfide phosphor activated with a lanthanide element is produced by the heating of a mixture of the oxides of the metals and sodium or potassium rhodanide.

3,563,910

CHEMICAL EMULSION COMPOSITIONS

Adolph E. Fishman, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y., a corporation of Virginia

No Drawing. Filed Nov. 20, 1967, Ser. No. 684,498

Int. Cl. B01j *13/00*

U.S. Cl. 252—312 **9 Claims**

Disclosure is made of emulsifier compositions based on polyalkoxy alcohol mixtures which are suitable for general emulsification of materials having a wide range of characteristics. In particular, emulsifier compositions are disclosed based on or derived from mixtures of normal and branched alcohols which provide highly stable aqueous emulsions with such diverse materials as aromatic hydrocarbons including benzene, xylene, and toluene; halo hydrocarbons including perchloroethylene; and open chain hydrocarbons including mineral oil, wax and kerosene.

3,563,911

STAGED FLUIDIZED CATALYST REGENERATION PROCESS

Robert W. Pfeiffer, Bronxville, N.Y., and Luther W. Garrett, Jr., Allison Park, Pa., assignors to Pullman Incorporated, Chicago, Ill., a corporation of Delaware

Continuation-in-part of application Ser. No. 528,594, Feb. 18, 1966, now Patent No. 3,421,884, which is a division of application Ser. No. 416,571, Dec. 7, 1964, now Patent No. 3,276,858, Oct. 4, 1966. This application Dec. 26, 1968, Ser. No. 787,148

Int. Cl. B01j *11/04, 11/68*

U.S. Cl. 252—417 **5 Claims**

A multi-staged method of removing carbonaceous deposits from particulate, fluidized material is disclosed. Said method is particularly applicable to the regeneration of cracking catalysts to low levels of carbon.

3,563,912

CATALYST COMPOSITION AND SULFIDING METHOD

Billy J. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif., a corporation of California

No Drawing. Filed Mar. 14, 1968, Ser. No. 712,905

Int. Cl. B01j *11/74*

U.S. Cl. 252—430 **16 Claims**

The invention relates to catalyst compositions comprising a finely divided active metallic component coated and/or impregnated with an air-imprevious, substantially

inert organic sealant such as petroluem wax, and also including sulfur either chemically combined as sulfide with the metallic component, or suspended or dissolved in said sealant. The resulting catalyst compositions can be safely shipped in commerce, loaded into catalytic reactors, purged with hot hydrogen to vaporize and/or hydrocrack the sealant while simultaneously producing a desirably active sulfided form of the catalyst. The basic objectives are to eliminate time consuming conventional presulfiding techniques in the reactor, and to provide means for safely shipping in commerce normally pyrophoric sulfide-containing catalysts.

3,563,913

SILVER CATALYST PRODUCTION

Gerrit de Krijger and Freddy Wattimena, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y., a corporation of Delaware

No Drawing. Filed Oct. 24, 1968, Ser. No. 770,432
Claims priority, application Great Britain, Oct. 30, 1967, 49,261/67
Int. Cl. B01j *11/06*
U.S. Cl. 252—463 5 Claims

Improved supported silver catalysts are prepared by impregnating a support with a solution of a reducible silver compound and passing the impregnated support, in the presence of a reducing agent, through a fluidized bed of inert particulate solids at an elevated temperature.

3,563,914

SILVER CATALYST

Freddy Wattimena, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y., a corporation of Delaware

Filed Nov. 28, 1967, Ser. No. 686,034
Claims priority, application Great Britain, Mar. 22, 1967, 13,486/67
Int. Cl. B01j *11/06*
U.S. Cl. 252—463 3 Claims

An improved silver catalyst obtained by impregnating a support with a solution of a reducible silver compound and rapidly removing absorbed liquid at an elevated temperature in the presence of a reducing agent.

3,563,915

PROCESS FOR LOWERING THE PYROPHORISM OF A NICKEL-ALUMINUM OR COBALT-ALUMINUM CATALYST

Roy J. Eisenhauer and John H. Lester, Jr., Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 701,110, Jan. 29, 1968. This application Sept. 3, 1969, Ser. No. 855,029
Int. Cl. B01j *11/08, 11/22*
U.S. Cl. 252—466 6 Claims

The pyrophorism of a nickel-aluminum or cobalt-aluminum catalyst can be substantially lowered by contacting the catalyst with an aqueous solution containing an effective passivating amount of dichromate or permanganate ion.

3,563,916

CARBON BLACK-SYNTHETIC RESINS ELECTROCONDUCTIVE COMPOSITION

Naomitsu Takashina, Fujiwawa-shi, Wakio Nagashima, Hiratsuka-shi, and Michiaki Furuno, Yokohama, Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan

No Drawing. Filed Aug. 19, 1968, Ser. No. 753,761
Claims priority, application Japan, Aug. 23, 1967, 42/54,066
Int. Cl. C09c *1/44;* H01b *1/06*
U.S. Cl. 252—511 3 Claims

A carbon black-synthetic resins electroconductive composition which, when formed into, a heating element exhibits markedly little time variation of electrical resistivity and high durability to continuous use at high temperature, and the characteristics of the composition residing in that the composition is consisted of: a carbon black-polymer of α, β-ethylenically unsaturated monomer composition of special type and a thermosetting aromatic polyamide resin.

3,563,917

QUINOXALINE POLYMERS

Carl S. Marvel, Tucson, Ariz., assignor to Research Corporation, New York, N.Y., a nonprofit corporation of New York

No Drawing. Filed Jan. 24, 1966, Ser. No. 522,378
Int. Cl. C08g *33/02*
U.S. Cl. 260—2 3 Claims

Thermostable single-and double - strand quinoxaline polymers are prepared by the condensation of aromatic amines with hydroxy-, halo- or phenoxy-substituted aromatic compounds.

3,563,918

METAL CONTAINING POLYMERS FROM CYCLIC TETRAMERIC PHENYLPHOSPHONITRILAMIDES

Robert M. Murch, Ashton, and Thomas Bieniek, Glen Burnie, Md., assignors, by mesne assignments, to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Mar. 18, 1968, Ser. No. 713,616
Int. Cl. C08g *33/16;* C07d *105/02*
U.S. Cl. 260—2 17 Claims

New polymers have been prepared which contain both cyclic tetrameric tetraphenylphosphonitrilic units and transition metal salts containing metallic cations chosen from the group consisting of copper (II), cobalt (II), nickel (II), and iron (II). These polymers are unique in phosphonitrilic chemistry in that they are soluble in common organic solvents and are thermally stable above 500° C.

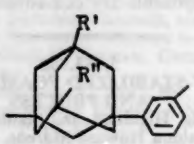
3,563,919

COPOLYMERS OF ADAMANTANE AND BENZENE

Abraham Schneider, Overbrook Hills, Pa., assignor to Sun Oil Company, Philadelphia, Pa., a corporation of New Jersey

No Drawing. Filed Mar. 25, 1969, Ser. No. 810,340
Int. Cl. C08g *33/00*
U.S. Cl. 260—2 15 Claims

Novel film forming hydrocarbon copolymers having the repeating unit



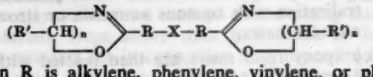
where R' and R'' are hydrocarbon radicals having 1–20 carbons, for example, methyl, are prepared by reacting 1,3-dimethyladamantane with a di (tertiary hydrocarbyl) benzene such as para-di-(t-butyl) benzene in the presence of $AlCl_3$ catalyst at around 0 to 25° C.

3,563,920

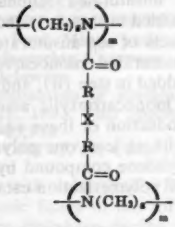
BI-2-OXAZOLINE AND OXAZINE ETHERS AND THIOETHERS

Donald A. Tomalia and Janet N. Paige, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

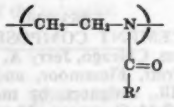
No Drawing. Filed June 16, 1969, Ser. No. 834,611
Int. Cl. C07d *85/36;* C08g *33/02, 45/00*
U.S. Cl. 260—2 4 Claims



Wherein R is alkylene, phenylene, vinylene, or phenylenealkylene, wherein, "alkylene" alone or in a combined name, designates an alkylene moiety that is of from 1 to 10 carbon atoms, and X is —S— or —O—; *n* is zero or 1; optionally also with an oxazoline as comonomer, are cationically polymerized to polymers containing recurring units of the formula



and, optionally, also units of the formula



wherein *g* is an integer 2 or 3, *m* represents the degree of polymerization, and R′ is hydrogen or a specified radical.

3,563,921

ION-EXCHANGE MEMBRANES

Guy Bourat, Bourg-la-Reine, France, assignor to Rhone-Poulenc S.A., Paris, France, a French body corporate

No Drawing. Filed Sept. 24, 1968, Ser. No. 762,136
Claims priority, application France, Sept. 25, 1967, 122,152
Int. Cl. C08g *29/24*
U.S. Cl. 260—2.1 10 Claims

Ion-exchange membranes of good mechanical properties are made from films of a vinyl chloride polymer or copolymer, either grafted with an aromatic vinyl monomer containing a tertiary nitrogen atom or mixed with a polymer of such a monomer, quaternised with an alkyl or aralkyl dihalide.

3,563,922

METHOD OF REGENERATING VULCANIZED RUBBER, RESULTING PRODUCTS, AND COMPOSITIONS CONTAINING THE REGENERATED PRODUCTS

Jean-Marie Massoubre, Clermont-Ferrand, France, assignor to Michelin & Cie, Clermont-Ferrand, France, a French company

No Drawing. Filed Jan. 8, 1963, Ser. No. 249,994
Claims priority, application France, Jan. 9, 1962, 884,228
Int. Cl. C08d *13/38;* C08f *47/24*
U.S. Cl. 260—2.3 5 Claims

A process for regenerating natural or synthetic rubber comprising the steps of swelling the rubber, preferably in finely divided form, with a solvent, adding a devulcanization agent to devulcanize the rubber and dissolve the rubber in the solvent. The solvent is substantially nonvolatile in a temperature range of 180–230° C. The liquid or semi-liquid regenerated product may subsequently be incorporated as a plasticizer into other rubbers.

3,563,923

OPTICALLY ACTIVE ADSORBENTS

David R. Buss, Kalamazoo, Mich., and Theodore Vermeulen, Berkeley, Calif., assignors to The Regents of the University of California

No Drawing. Filed July 26, 1967, Ser. No. 656,077
Int. Cl. C08f *27/00*
U.S. Cl. 260—2.5 19 Claims

Adsorbents formed through the reaction of compounds containing an amino group and an asymmetric carbon, with a polymer having formyl groups spaced within an insoluble, swellable, cross-linked polymer matrix. These adsorbents are especially useful for the resolution of optical isomers.

3,563,924

SURFACTANT-CATALYST MIXTURES FOR FLEXIBLE POLYESTER URETHANE FOAMS

Eric G. Schwarz, Somers, N.Y., assignor to Union Carbide Corporation, a corporation of New York

No Drawing. Continuation-in-part of application Ser. No. 396,378, Sept. 14, 1964. This application Apr. 4, 1968, Ser. No. 718,920
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 11 Claims

This invention relates to two types of surfactant catalyst mixtures for the use in producing flexible polyester urethane foams. The surfactants are siloxane-oxyalkylene copolymers which are characterized by certain molecular weights, siloxane contents and oxyethylene contents. The catalysts include both conventional amine catalysts and certain highly active catalysts (certain amine and tin catalysts) which have not been used previously to produce flexible polyester urethane foams. Compared to conventional organic emulsifiers, the novel surfactant-catalyst mixtures produce low density foam having finer, more uniform cell structure and high density foams with less shrinkage.

3,563,925

COMPOSITION CONTAINING INTERLOCKED FOAMS OF PARTLY TANNED COLLAGEN AND CROSS-LINKED GLYCOL METHACRYLATE POLYMER

Karel Kliment, Miroslav Stol, and Milos Chvapil, Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

No Drawing. Filed Dec. 20, 1967, Ser. No. 691,947
Int. Cl. C08f *47/08;* C08h *7/00*
U.S. Cl. 260—8 3 Claims

A continuous solid material consisting of interlocked three-dimensional networks of hydrated, partly tanned collagen and sparingly cross-linked, hydrated polymers of glycol methacrylate, when made into blood vessels, urinary bladders, and other body parts, is impervious to liquid when freshly implanted, yet readily penetrated by tissue growth, and well tolerated when the pores in the polymer are between 150 and 450 microns in diameter, and the collagen amounts to 10%–50% of the total dry weight of polymer and collagen.

3,563,926

PROCESS FOR PRODUCING WATER-SOLUBLE SYNTHETIC RESINS

Heinrich W. Lackner, Graz, Austria, assignor to Vianova-Kunstharz, A.G., Graz, Austria, an Austrian company

No Drawing. Continuation-in-part of application Ser. No. 698,108, Jan. 16, 1968. This application May 24, 1968, Ser. No. 731,696
Claims priority, application Austria, June 21, 1967, A 5,760/67
Int. Cl. C08g *5/18, 9/36*
U.S. Cl. 260—19 16 Claims

An improved process for preparing water-soluble resins comprising the reaction product of (I) the pre-condensate

of (a) a resinous epoxide, and (b) a heat-reactive composition which contains free or blocked methylol groups; and (II) polycarboxylic acids or their anhydrides is described. According to the process, one component of the heat-reactive composition is initially reacted with the resinous epoxide with the pre-condensate being thereafter formed by the addition of an aldehyde, and/or a reactive aldehyde condensate. Water solubility is imparted to the resins obtained by the addition of a nitrogen base.

3,563,927

AMINOAMIDES AND CURING OF EPOXY RESINS

Rainer Janssen, Kamen, Manfred Drawert, Werne an der Lippe, and Eugen Griebsch, Unna, Germany, assignors to General Mills, Inc., a corporation of Delaware

No Drawing. Filed Jan. 30, 1968, Ser. No. 701,542
Claims priority, application Germany, Feb. 15, 1967, Sch 40,235
Int. Cl. C08g *20/26, 30/14*
U.S. Cl. 260—18 **5 Claims**

There is disclosed the preparation of aminoamides of polymeric fat acids and an excess of certain ether diamines and the curing of epoxy resins therewith the ether diamine is of the formula:

$$H_2N—R—O(CH_2)_n—O—R—NH_2$$

where R is $—CH_2—CH_2—$, $CH_2—CH_2—CH_2$, or

$$—CH_2—\underset{\displaystyle CH_3}{\underset{|}{CH}}—CH_2—$$

and *n* is 3, 4, *5*, or 6.

The aminoamides, particularly in combination with epoxy resins, find utility as coating compositions, sealing compounds, troweling compounds, adhesives and laminates.

3,563,928

PROMOTER FOR BUILDING TACK IN A HYDROCARBON ELASTOMER

Kenneth Francis King, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed July 1, 1969, Ser. No. 838,358
Int. Cl. C08f *29/12*
U.S. Cl. 260—19 **11 Claims**

In an EPDM elastomer tackified by (a) adding a polar organic cyclic resin, (b) aging the resulting mixture and (c) exposing the surface to an activating agent, tack formation is promoted by compounding the elastomer with an oil-soluble, organic salt of a transition metal. Alternatively, tack can be developed on the surface of an EPDM elastomer by (a) coating the surface with a cement made by mixing an EPDM elastomer, a polar organic cyclic resin and an oil-soluble organic salt of a transition metal, in a solvent, (b) drying the cement and (c) exposing the coated surface to an activating agent.

3,563,929

METHOD FOR PRODUCING WATER-DILUTABLE EPOXY ESTER RESINS CONTAINING COPOLYMERS OF VINYL AND/OR VINYLIDENE COMPOUNDS

Rolf Guldenpfennig, Dossenheim, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

No Drawing. Filed Oct. 9, 1967, Ser. No. 673,997
Claims priority, application Germany, Nov. 2, 1966, R 44,502
Int. Cl. C08g *45/00*
U.S. Cl. 260—23 **20 Claims**

The invention relates to a process for the production of improved water-dilutable epoxy resin esters which are prepared as follows:

(a) partial esters with hydroxyl groups and epoxy groups are first formed by partial esterification of compounds containing epoxy or hydroxyl groups with mixtures of monocarboxylic acids consisting mainly of unsaturated aliphatic straight chain monocarboxylic acids;

(b) the resulting partial esters are then reacted with polybasic carboxylic acids in such a manner that the epoxy resin esters with free carboxyl and free hydroxyl groups are rendered water-dilutable by neutralization with aqueous ammonia or strong organic nitrogen bases;

(c) epoxy resin esters are then reacted with aqueous ammonia and/or strong organic nitrogen bases in the presence of water, until they are converted into sufficiently water-dilutable synthetic resins, the improvement comprising:

(1) the epoxy resin esters in step (a) and/or
(2) in step (b), and/or
(3) the unsaturated aliphatic monocarboxylic acids added in step (a), and/or
(4) adducts of α,β-unsaturated dicarboxylic acids on unsaturated monocarboxylic acids, preferably added in step (b), and/or
(5) the monocarboxylic acids that are used for the production of these adducts, are copolymerized with at least one polymerizable vinyl and/or vinylidene compound by heating in the presence of polymerization catalysts.

3,563,930

CEMENT COMPOSITION

Michael A. Stram, Chicago, Jerry A. Dieter, Park Forrest, Richard J. Pratt, Flossmoor, and David W. Young, Homewood, Ill., assignors, by mesne assignments, to Atlantic Richfield Company, New York, N.Y., a corporation of Pennsylvania

No Drawing. Filed Apr. 1, 1968, Ser. No. 717,962
Int. Cl. C04B *7/02;* **C08g** *51/04;* **C08k** *1/02*
U.S. Cl. 260—40 **14 Claims**

Air entrainment in portland cements is increased by the addition to the cement prior to curing of minor amounts of water-soluble salts of styrene-maleic anhydride copolymers or the water-soluble half-esters or the water-soluble salts of half-esters of styrene-maleic anhydride copolymers and alkoxy polyalkylene glycols or other alcohols. Increased air entrainment in the cement provides superior durability and resistance.

3,563,931

METHOD OF MAKING CHROMOGEN-BONDED-POLYMER AND PRODUCTS THEREOF

Shojiro Horiguchi, 965 Shimohoya, Hojamachi, Kitatamagun, Tokyo, Japan, and Michiei Nakamura, 156 5-chome, Motobuto-cho, Urawa-shi, Saitama-ken, Japan

No Drawing. Filed Aug. 6, 1965, Ser. No. 477,932
Int. Cl. C08f *1/84, 45/66;* **C08g** *51/66*
U.S. Cl. 260—41 **13 Claims**

A method of making a chromogen-bonded-polymer which comprises the steps of diazotizing a chromogen-containing amino compound in aqueous medium containing hydrochloric acid in a quantity which exceeds its theoretically required molar quantity of hydrochloric acid by at least 10 mols per one amino radical to produce the diazotized product of the chromogen; stabilizing the diazotized product with a stabilizer to produce the stabilized diazonium or diazo product of the chromogen; mixing the resulting stabilized product with an addition polymerizable monomer; and polymerizing the monomer using the stabilized diazonium or diazo product as an initiator for the polymerization of the monomer to form the chromogen-bonded-polymer.

3,563,932
METHOD OF CONVERTING ELASTOMERIC MATERIALS INTO POWDERS

Ervin J. Varnagy, Tallmadge, and David C. Mowrer, Akron, Ohio, assignors to The General Tire & Rubber Company, a corporation of Ohio

No Drawing. Filed Oct. 11, 1968, Ser. No. 766,946
Int. Cl. C08k 45/06, 45/08, 47/07
U.S. Cl. 260—41 4 Claims

This invention concerns a method of converting elastomeric materials, from either their bulk form or latex form, into powders for incorporation and dispersion into plastic laminates, comprising, admixing a filler to a liquid elastomeric material system, evaporating the liquid therefrom, forming thin flakes of substantially dry elastomeric material and filler, drying and crushing said flakes to form a powder.

3,563,933
MOLDING COMPOSITION

David A. Stivers, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware

No Drawing. Continuation of application Ser. No. 267,312, Mar. 22, 1963. This application Mar. 3, 1969, Ser. No. 803,936
Int. Cl. C08f 45/04; C08k 1/08
U.S. Cl. 260—41 7 Claims

The incorporation with vulcanizable highly fluorinated elastomers of inorganic fillers in the form of flakes and in quantity to reduce shrinkage during vulcanization or molding without materially detracting from the other physical properties of the vulcanite.

3,563,934
STABILIZED, PLASTICIZED POLYPHENYLENE OXIDE COMPOSITIONS

Robert E. Burnett, Schenectady, N.Y., assignor to General Electric Company, a corporation of New York

Filed Apr. 22, 1969, Ser. No. 818,425
Int. Cl. C08g 51/26, 51/60
U.S. Cl. 260—30.4 10 Claims

Incorporation of an alkanolamine or a morpholine in a polyphenylene oxide improves the flow and stability of the polymer during molding. These properties permit lighter colored objects to be more easily molded from the polymers.

3,563,935
MOLDING COMPOUNDS ON A BASIS OF PLASTICIZED POLYVINYL CHLORIDE OR VINYL CHLORIDE COPOLYMERS

Rolf Beckmann, Siegburg, Gerhard Bier and Heinz Diessel, Troisdorf, and Hans-Ewald Konermann, Oberlar, Germany, assignors to Dynamit Nobel Aktiengesellschaft, a corporation of Germany

No Drawing. Filed June 13, 1967, Ser. No. 645,632
Claims priority, application Germany, June 18, 1966, D 50,341
Int. Cl. C08f 29/24, 45/40
U.S. Cl. 260—31.8 8 Claims

Molding compounds on a basis of plasticized polyvinyl chloride or vinyl chloride copolymers are disclosed which comprise from 40 to 75 weight percent of tactic polyvinyl chloride or tactic vinyl chloride copolymers having a comonomer percentage of 0.5 to 20% by weight and with 55 to 80% of their chlorine atoms in a syndiotactic arrangement, from 20 to 50 weight percent and preferably 25 to 40 weight percent of diisotridecyl phthalate as plasticizer, and from 5 to 50 weight percent and preferably 15 to 30 weight percent of a chlorine compound whose chlorine content exceeds that of the polyvinyl chloride or of the vinyl chloride copolymer, and preferably having a chlorine content of 57 to 73 weight percent.

3,563,936
PLASTISOL COMPOSITION

Edward W. Merrill, Cambridge, and Jacob M. Pikarsky, Arlington, Mass., assignors to W. R. Grace & Co., Cambridge, Mass., a corporation of Connecticut

Filed May 16, 1968, Ser. No. 729,651
Int. Cl. C08f 29/20, 45/36
U.S. Cl. 260—31.8 14 Claims

A plastisol composition containing as the resin component 10 to 50 parts by weight of dispersion grade vinyl chloride polymer and 50 to 90 parts by weight of mass-polymerized vinyl chloride polymer. The amount of plasticizer employed in the composition can range from 50 to 110 parts by weight per hundred parts by weight of the resin component.

3,563,937
MONOVINYLIDENE AROMATIC HYDROCARBONS-HALF ESTERS OF UNSATURATED DICARBOXYLIC ACIDS OR ANHYDRIDES AS RESINOUS BINDERS FOR PRINTING INKS

Ralph F. Nickerson, West Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo., a corporation of Delaware

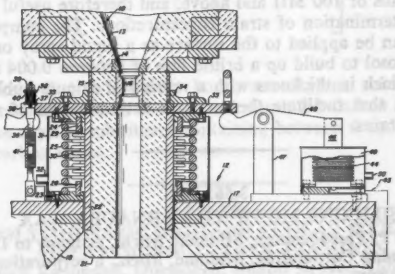
No Drawing. Filed Mar. 20, 1968, Ser. No. 714,458
Int. Cl. C08f 19/10, 41/06, 45/34
U.S. Cl. 260—33.4 7 Claims

An ink for a steam-set printing process comprising a organic solvent such as diethylene glycol, triethylene glycol and mixtures thereof, a pigment, and a resinous binder comprising half-esters of styrene-maleic anhydride copolymers which are soluble in the solvent but insoluble in water. The ink is used in a steam-set printing process whereby the binder and pigment are caused to precipitate on a porous surface by the action of water or water vapor.

3,563,938
INLET CONSTRUCTION FOR VACUUM VESSELS

Francis Gallucci, North Huntingdon Township, Westmoreland County, Pa., assignor to United States Steel Corporation, a corporation of Delaware

Filed May 16, 1969, Ser. No. 825,255
Int. Cl. C21c 7/10
U.S. Cl. 266—34 3 Claims



The invention is an improvement over an inlet construction shown in an earlier application. The earlier construction includes a vertically movable tube mounted in the inlet opening of a vacuum vessel, a spring urging the tube upwardly into contact with a teeming vessel, and a bellows surrounding the tube to retain the vacuum. The improvement is an arrangement to balance the downward pull of the vacuum on the tube, whereby the full force of the spring urges the tube upwardly.

3,563,939

ALUMINO-ORGANIC BINDER COMPOSITIONS

John J. Stevens, Jr., Highland Park, and Charles T. Patrick, Jr., and John Wynstra, Somerville, N.J., assignors to Union Carbide Corporation, a corporation of New York

No Drawing. Filed June 4, 1968, Ser. No. 734,239

Int. Cl. C08g 51/04

U.S. Cl. 260—37 22 Claims

Hydrated alumina having a low alkali metal content as a filler for organic compositions.

3,563,940

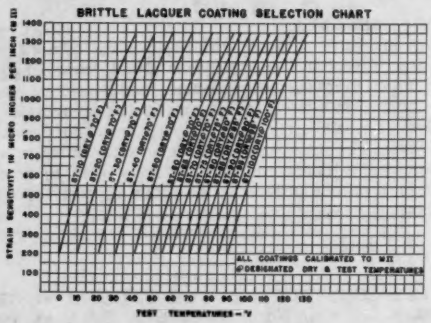
RESINOUS COMPOSITION FOR DETERMINING SURFACE STRAIN CONCENTRATIONS IN RIGID ARTICLES

James S. Borucki, Chicago, Ill., assignor to Magnaflux Corporation, Chicago, Ill., a corporation of Delaware

Continuation-in-part of application Ser. No. 602,703, Dec. 19, 1966. This application July 1, 1968, Ser. No. 741,629

Int. Cl. C08f 31/02; C09d 5/20

U.S. Cl. 260—23.3 3 Claims



A liquid resinous composition comprising a water resistant resin of suitable melting point and a plasticizer dissolved in a volatile solvent, capable of forming, when dried on the surface of a rigid article, a thin brittle film that is relatively insensitive to humidity and that, within a temperature range of 0° to 130° F., is highly sensitive to strains of 100 MII and above, and therefore useful for the determination of strain concentrations. The composition can be applied to the surface as a liquid spray or as an aerosol to build up a brittle film of between 0.004 and 0.009 inch in thickness with a myriad of minute bubbles therein that facilitate the accurate determination of surface strains.

3,563,941

SILICONE MODIFIED CARNAUBA WAX

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich., a corporation of Delaware

No Drawing. Continuation of application Ser. No. 443,658, Mar. 29, 1965. This application Nov. 14, 1969, Ser. No. 871,526

Int. Cl. C07f 7/18; C08h 9/06; C08k 1/64

U.S. Cl. 260—28 19 Claims

A silicone-carnauba wax copolymer is disclosed. The silicone-carnauba wax is a copolymer of an organosilicon compound and carnauba wax bonded together by predominantly ether linkages. The silicone-carnauba wax copolymers are waxes useful as lipsticks, floor wax, furniture wax and the like.

3,563,942

AQUEOUS DISPERSION OF COPOLYESTERS MODIFIED WITH A SULFONATED AROMATIC COMPOUND

Philip Heiberger, Broomall, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed Nov. 29, 1967, Ser. No. 686,712

Int. Cl. C08g 51/24; C08j 1/46; C09d 5/02

U.S. Cl. 260—29.2 11 Claims

New solvent-soluble linear copolyester compositions which can be dispersed in aqueous mediums. Water dispersibility is gained by the addition to the copolyesters of about 1–2% (molar) of the metal salt of a sulfonated aromatic compound such as sodium dimethyl-5-sulfoisophthalate. These copolyesters have improved adhesion and are useful as coating compositions particularly where it is desirable to avoid the toxic, polutant, and corrosive effects which are present with most organic solvent-borne polyesters.

3,563,943

NONIONIC URETHANE LATICES HAVING IMPROVED LOW TEMPERATURE STABILITY

Pauls Davis, Gibralter, and Oscar M. Grace, Madison Heights, Mich., assignors to Wyandotte Chemicals Corporation, Wyandotte, Mich., a corporation of Michigan

No Drawing. Filed Feb. 5, 1968, Ser. No. 702,810

Int. Cl. C08g 53/18; C08j 1/48

U.S. Cl. 260—29.2 5 Claims

Nonionic urethane latices having improved low temperature stability are obtained by the use of certain oxyethylene-containing compounds as emulsifiers therefor. The oxyethylene-containing emulsifiers are prepared by the reaction of aromatic diepoxides with polyethylene glycol.

3,563,944

COLLOID FREE EMULSIONS OF VINYL ACETATE COPOLYMERS

Ralph H. Bauer, Huntington Beach, and Peter Stanley Backlund, Anaheim, Calif., assignors to Union Oil Company of California, Los Angeles, Calif., a corporation of California

No Drawing. Filed Nov. 24, 1967, Ser. No. 685,300

Int. Cl. C08f 1/13, 45/24

U.S. Cl. 260—29.6 7 Claims

Copolymerization of vinyl acetate with acrylates, malates and fumarates in a colloid free aqueous media using a three-component emulsion. The last component is added following completion of the polymerization.

3,563,945

ENZYME STABILIZED POLYVINYLIDENE CHLORIDE LATEX

Donald L. Johnson, Thomas F. Protzman, and Jerrel L. Zimmerman, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill., a corporation of Delaware

No Drawing. Filed Apr. 10, 1968, Ser. No. 720,382

Int. Cl. C08f 45/24; C09d 5/02

U.S. Cl. 260—29.6 11 Claims

A non-corrosive, stable polyvinylidene chloride latex is produced by adding corrosion inhibiting amounts of a peroxide destroying enzyme such as a peroxidase or catalase to a polyvinylidene chloride latex containing residual peroxides. The stabilized composition has particular utility as a coating for cellulosic substrates.

3,563,946

PROCESS FOR LATEX MANUFACTURE

Frederick A. Miller, Midland, Robert J. Pueschner, St. Louis, Carl L. Dibert, Hemlock, and Dennis A. Kee, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 470,904, July 9, 1965. This application Jan. 8, 1968, Ser. No. 696,121

Int. Cl. C08d *1/09, 3/02*

U.S. Cl. 260—29.7 9 Claims

A process for preparing synthetic latexes by emulsion polymerization of monomer compositions containing at least 30 percent by weight of a conjugated diethylenically unsaturated monomer such as 1,3-butadiene by (a) substantially concurrently and substantially continuously feeding at least one aqueous stream and at least one oily stream containing at least a portion of the monomer composition, each stream being at a temperature between its freezing point and 50° C., into a closed polymerization zone maintained at a temperature of at least about 90° C.; also feeding, optionally continuously, a free-radical producing compound into the polymerization zone either in a separate stream or as a portion of one of the continuous streams and (b) agitating the resulting mixture until polymerization is substantially complete.

3,563,947

CHLOROPRENE POLYMERS CONTAINING NORBORNENE DERIVATIVES AS ANTIOZONANTS

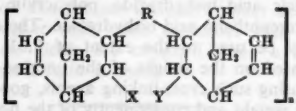
Wilhelm F. Gruber, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed June 9, 1969, Ser. No. 831,771

Int. Cl. C08d *11/04*

U.S. Cl. 260—45.85 9 Claims

Elastomeric chloroprene polymers, for use under severe flexing and stretching conditions and where color development and substrate-staining must be avoided, are given enhanced stability against deterioration by ozone by incorporating therein about from 0.3 to 10 parts, per 100 parts of polymer, of a di-norbornene compound having the structure:



wherein X and Y are, independently, hydrogen, alkyl, aryl, aralkyl or alkaryl; R is a divalent organic radical containing at least two carbon atoms; and *n* is a number in the range of 1 to 3.

3,563,948

METAL DERIVATIVES OF ALKYLHYDROXYPHENYLALKYLPHOSPHINIC ACIDS AND COMPOSITIONS CONTAINING THESE DERIVATIVES

John D. Spivack, Spring Valley, N.Y., assignor to Geigy Chemical Corporation, Ardsley, N.Y., a corporation of New York

No Drawing. Original application Jan. 30, 1967, Ser. No. 612,336, now Patent No. 3,488,368, dated Jan. 6, 1970. Divided and this application May 21, 1969, Ser. No. 856,510

Int. Cl. C08f *45/62*; C08g *51/62*

U.S. Cl. 260—45.75 5 Claims

The preparation of metal and metal complex salts of alkylhydroxyphenylalkylphosphinic acids and the use thereof in the preparation of polymeric compositions of increased stability and increased susceptibility to dye. A typical embodiment is nickel bis[(3,5-di-t-butyl - 4 - hydroxybenzyl)benzenephosphinate].

3,563,949

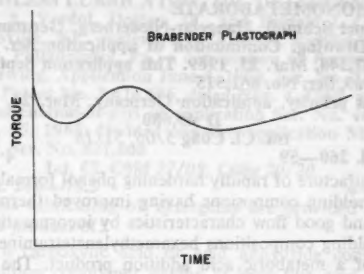
STABILIZATION OF POLYMERS

Bruce W. Habeck, Cuyahoga Falls, and Donald E. Miller, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio

Filed Oct. 19, 1967, Ser. No. 676,428

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.95 6 Claims



Polymers containing divinyl benzene and stabilized with phenolic stabilizers such as 2,5-ditert.butyl hydroquinone and 4,4'-methylene bis(2,6-ditert.butyl phenol).

3,563,950

LINEAR POLYBENZOXAZOLES

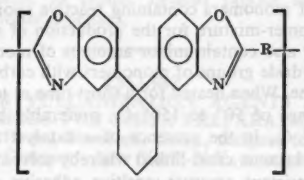
Henry W. Steinmann, Sparta, and Edward T. Pollard, Middlesex, N.J., assignors to Celanese Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed July 9, 1969, Ser. No. 840,464

Int. Cl. C08g *33/04*

U.S. Cl. 260—47 12 Claims

Aromatic and nonaromatic diacyl halides are reacted with 1,1-bis(3-amino - 4 - hydroxyphenyl) cyclohexane to produce linear polyamides which are transformed by thermal treatment into linear polybenzoxazoles comprising recurring units of the following formula:



wherein R is a covalent bond, an alkylene substituent containing between about 1 and about 2 0 carbon atoms, or an arylene substituent containing between 6 and about 20 carbon atoms.

3,563,951

POLYIMIDES OF HIGH MOLECULAR WEIGHT AROMATIC POLYETHER DIAMINES

Eduard Radlmann, Dormagen, Rudolf Braden, Odenthal-Scheuren, and Günther Nischk, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany

No Drawing. Continuation of application Ser. No. 707,988, Feb. 26, 1968. This application Oct. 16, 1969, Ser. No. 867,434

Claims priority, application Germany, Mar. 6, 1967, F 51,728

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 2 Claims

The invention relates to polyimides which are soluble in organic solvents and to a process for their production

by condensing aromatic tetracarboxylic acids or their derivatives with high molecular weight aromatic polyether diamines.

3,563,952

NOVOLAK MOLDING COMPOUNDS CONTAINING HEXAMETHYLENETETRAMINE MONOMETABORATE

Kurt Schmoll, Hangelar-Niederberg, Germany

No Drawing. Continuation of application Ser. No. 627,248, Mar. 23, 1969. This application Sept. 26, 1969, Ser. No. 861,515

Claims priority, application Germany, Mar. 24, 1966, D 49,680

Int. Cl. C08g *5/06, 51/18*

U.S. Cl. 260—59 4 Claims

Manufacture of rapidly hardening phenol formaldehyde resin molding composions having improved thermal stability and good flow characteristics by incorporating into the molding compositions hexamethylenetetramine in the form of a metaboric acid addition product. The resulting molding composition is then rolled and ground to produce the molding composition of improved properties.

3,563,953

CURABLE COPOLYMER OF AN ALKYL ACRYLATE, A GLYCIDYL ACRYLATE OR METHACRYLATE AND DIKETENE

Gotthold Wilhelm Horst Lehmann and Heinrich August Julius Curts, Hamburg, Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

No Drawing. Continuation-in-part of application Ser. No. 549,468, May 12, 1966. This application Feb. 2, 1970, Ser. No. 8,033

Claims priority, application Germany, May 19, 1965, B 82,010

Int. Cl. C08g *15/00*

U.S. Cl. 260—63 1 Claim

Novel pressure-sensitive adhesives from curable copolymers formed by polymerization of a mixture of (a) one or more primary alkyl acrylates and (b) a minor amount of monomers containing reactive epoxide groups. The monomer-mixture for the production of said copolymers may also contain minor amounts of monomers with acid anhydride groups of monomers with carboxyl groups or diketene. When heated for a short time at temperatures in the range of 50° to 150° C., preferably between 60° and 100° C., in the presence of a catalyst the said copolymers become cross-linked whereby solvent-, heat- and weather-resistant pressure-sensitive adhesive compositons are obtained. The low temperature curing property is particularly useful in the production of pressure-sensitive adhesive-coated films and foils.

3,563,954

PROCESS FOR PREPARING PURIFIED GLYCERINE

Bernard Michael Birmingham, Jr., Aurora, Ill., assignor to Armour and Company, Chicago, Ill., a corporation of Delaware

No Drawing. Filed Oct. 19, 1967, Ser. No. 676,605

Int. Cl. C07c *29/24*

U.S. Cl. 260—637 5 Claims

In the process for preparing purified glycerine from sweetwater and like crude glycerine solutions in which the sweetwater is treated with lime and soda ash, evaporated and distilled, and color bleached with activated carbon; the step which comprises treating said sweetwater, after distillation and prior to color bleaching, with an ion exchange resin.

3,563,955

PROCESS FOR CROSS-LINKING POLYACETAL COPOLYMERS WITH HYDROZINE OR DICARBOXYLIC ACID HYDRAZIDES AND PRODUCT PRODUCED THEREBY

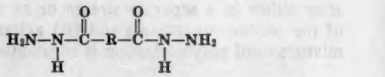
Karl-Heinz Hafner, Bad Orb, and Edgar Fischer, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany, a corporation of Germany

No Drawing. Continuation-in-part of applications Ser. No. 558,245, June 17, 1966, now Patent No. 3,454,528, dated July 8, 1969, and Ser. No. 581,760, Sept. 26, 1966. This application Jan. 7, 1969, Ser. No. 789,604

Int. Cl. C08g *9/04, 9/06*

U.S. Cl. 260—72.5 7 Claims

A process for cross-linking polyoxyalkylene copolymers having pendant free aldehyde groups spaced along the polymer chain thereof with hydrazine or a dicarboxylic acid hydrazide of the formula



wherein R stands for an alkylene radical of 1 to 20 carbon atoms, a phenylene or naphthylene radical which is substituted by $(A)_x$ and/or $(B)_y$, A being an alkyl group of 1 to 6 carbon atoms, x being 0 to 4, y being 0 to 4 and $x+y$ being smaller than 5, or in which R stands for a phenylene and/or naphthylene radical which is or are interrupted by a saturated and/or unsaturated hydrocarbon radical with 1 to 10 carbon atoms, or in which R is a cycloaliphatic radical of 4 to 7 carbon atoms which is substituted by $(D)_a$ and/or $(E)_b$ and/or $(F)_c$, D being an alkyl group of 1 to 6 carbon atoms, E being an alkoxy group of 1 to 6 carbon atoms and F being a phenyl radical, and a being 0 to 5, b being 0 to 5 and c being 0 to 2, or in which R is a polyacrylic acid radical. Representative dicarboxylic acid dihydrazides are adipic acid bishydrazide, sebacic acid bishydrazide, polyacrylic acid hydrazide and terephthalic acid bishydrazide. The cross-linking agent may be used to the extent of 0.01 to 50% by weight, based on the weight of the uncross-linked polymer. By using such cross-linking agents, good control of molecular weight and consequently of the flow properties of the cross-linked copolymer are obtained. The cross-linked polymers are also claimed.

3,563,956

PROCESS FOR THE MANUFACTURE OF POLYALKYLENE TEREPHTHALATES USING ZINC AMINO-TRIETHANOLATE AS TRANSESTERIFICATION CATALYST

Paul Hilaire, Lyon, France, assignor to Societe Rhodiaceta, Paris, France, a corporation of France

No Drawing. Filed Oct. 29, 1968, Ser. No. 771,624

Claims priority, application France, Oct. 30, 1967, 126,388

Int. Cl. C07c *67/02;* C08g *17/013, 17/015*

U.S. Cl. 260—75 5 Claims

In the production of filament- or film-forming polyalkylene terephthalates by transesterification followed by polycondensation, zinc aminotriethanolate is used as the transesterification catalyst, preferably in combination with the use of bismuth aminotriethanolamine as the polycondensation catalyst. Much smaller amounts of these catalysts can be used than of prior art catalysts, and the product has a high degree of thermal stability.

3,563,957

ETHYLENEUREA-TERMINATED POLYURETHANE PREPOLYMERS AND CURED PRODUCTS THEREOF

George W. Beebe, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn., a corporation of Delaware

No Drawing. Filed Oct. 3, 1968, Ser. No. 764,943
Int. Cl. C08g *22/04*
U.S. Cl. 260—77.5 24 Claims

Isocyanate-terminated polyurethane prepolymers, such as those based on poly(oxypropylene) triols, are reacted with certain active hydrogen-containing ethylene urea derivatives, such as N-hydroxyalkyl or N-aminoalkyl derivatives, to produce corresponding ethyleneurea-terminated prepolymers, which can be crosslinked, for example, with latent crosslinking agents, such as bis (alkoxyalkyl)ethyleneurea, and an acid catalyst to provide cured or crosslinked polyurethane-like materials useful as coatings and adhesives.

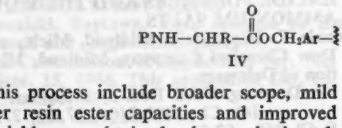
3,563,958

ESTERIFICATION OF ARYLMETHYLENE SULFONIUM RESINS WITH N-PROTECTED AMINO ACIDS FOR USE IN SOLID-PHASE PEPTIDE SYNTHESIS

Linneaus C. Dorman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Apr. 2, 1968, Ser. No. 718,241
Int. Cl. C07c *103/52*; C08g *20/08*
U.S. Cl. 260—78 10 Claims

The Merrifield solid-phase peptide synthesis is improved by bonding the amino acid to the supporting resin through reaction of an N-protected amino acid (I) with an arylmethylene sulfonium resin (II) to form an amino acid resin benzyl ester (IV):



Advantages of this process include broader scope, mild conditions, higher resin ester capacities and improved yields. Highest yields are obtained when a basic salt of the sulfonium resin is used.

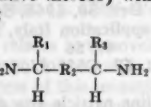
3,563,959

PROCESS FOR THE PRODUCTION OF TRANSPARENT POLYAMIDES WHICH ARE RESISTANT TO BOILING

Gerhard Schade, Witten-Bommern, Hermann Richtzenhain, Cologne-Sulz, Helmut A. de Fuenten, Mondorf, and Franz Blaschke, Witten (Ruhr), Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

No Drawing. Continuation-in-part of application Ser. No. 685,720, June 26, 1967. This application Jan. 31, 1969, Ser. No. 795,727
Claims priority, application Germany, June 25, 1966, D 50,392
Int. Cl. C08g *20/00*
U.S. Cl. 260—78 6 Claims

Transparent polyamides resistant to boiling are produced by reacting an aromatic dicarboxylic acid (or an amide-forming derivative thereof) with a diamine having the general formula:



wherein R_1 is hydrogen or an alkyl group of 1 to 4 carbon atoms, R_2 is an alkylene group having 1 to 10 carbon atoms in the chain or a phenylene group, and R_3 is an alkyl group of 1 to 4 carbon atoms. About 1 to 25% by weight of the reactants can be replaced by caprolactam. The products are especially useful for making transparent thin films.

3,563,960

ASHLESS LUBRICATING OIL DETERGENTS

Joseph A. Verdol, Dolton, Ill., and Donald J. Carrow, Louisville, Ky., assignors to Atlantic Richfield Company, Philadelphia, Pa., a corporation of Pennsylvania

No Drawing. Application June 4, 1968, Ser. No. 734,210, now Patent No. 3,476,686, dated Nov. 4, 1969, which is a continuation-in-part of application Ser. No. 487,624, Sept. 15, 1965. Divided and this application Mar. 17, 1969, Ser. No. 831,800
Int. Cl. C08f *27/08*; C08g *20/20*
U.S. Cl. 260—78.5 4 Claims

Ashless lubricating oil detergents are provided by the reaction product of:

(A) a carboxylic acid or acid anhydride containing addition copolymer having at least two acid or anhydride groups, optionally composed in part of monomeric carboxylic acid or anhydride,
(B) an amine, and
(C) an aminophenol.

3,563,961

REACTIVE ALPHA OLEFIN POLYSULFONES

William S. Pickle, New Orleans, La., and Nicholas B. Lorette, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,425
Int. Cl. C08f *13/06*
U.S. Cl. 260—78.5 5 Claims

Olefin polysulfones which are the reaction product of sulfur dioxide, at least one alpha olefin of from 4 to 40 carbon atoms and a monomer chosen from monoolefinically unsaturated carboxylic acid chlorides or monoolefinically unsaturated dicarboxylic anhydrides are useful to coat and protect various substrates. They are particularly useful to render natural fabrics shrink resistant and water repellant.

3,563,962

RUBBER VULCANIZATION AGENTS AND METHODS FOR THEIR PREPARATION

Stanley B. Mirviss, Stamford, Conn., assignor to Stauffer Chemical Company, New York, N.Y., a corporation of Delaware

No Drawing. Filed Dec. 13, 1967, Ser. No. 690,062
Int. Cl. C08f *27/06*
U.S. Cl. 260—79 7 Claims

Superior vulcanization agents for rubber are prepared by heating conjugated diolefins with sulfur in the presence of catalytic amounts of phosphorus sulfides.

3,563,963

PROCESS FOR THE PREPARATION OF MIXED POLYMERIZATES OF OLEFINIC COMPOUNDS

Gerhard Beier and Eduard Bermeister, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany, a corporation of Germany

No Drawing. Filed Dec. 3, 1968, Ser. No. 780,879
Int. Cl. C08f *15/00*
U.S. Cl. 260—79.3 5 Claims

This invention relates to an improvement in the process of copolymerizing alkenes having from 2 to 6 carbon atoms and free-radical-polymerizable monomers utilizing a catalyst system of (1) an inorganic or organic per-compound, (2) hydrogen and compounds splitting off hydrogen and (3) a colloidally dispersed noble metal,

said improvement consisting of utilizing from 0.000001% to 0.01% by weight, based on the monomers utilized, of said colloidally dispersed noble metal in combination with metallic ions selected from the group consisting of iron, copper, nickel, cobalt, chromium, molybdenum, vanadium, cerium and mixtures thereof, wherein the amount of said metallic ions is from 0.01 to 10 gm./atom per gm./atom of said noble metal and does not exceed 0.001% by weight, based on the monomers utilized, and conducting said polymerization at a temperature between −50° C. and +50° C.

3,563,964

HIGH MOLECULAR WEIGHT ETHYLENE COPOLYMERS PRODUCED BY COORDINATION CATALYSTS CONTAINING ANHYDROUS HYDROGEN HALIDE

Joseph Wagensommer, Westfield, N.J., assignor to Esso Research and Engineering Company, a corporation of Delaware

Filed Dec. 23, 1965, Ser. No. 526,648
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.78 11 Claims

Elastomers having novel microstructures are prepared from ethylene and C_3–C_{10} alpha-olefins polymerized in the presence of a Ziegler-type catalyst and anhydrous hydrogen halide.

3,563,965

PROCESS FOR THE PREPARATION OF A CYANATED VINYL MONOMER-CONTAINING COPOLYMER HAVING RESISTANCE TO COLORATION

Akihiko Kishimoto, Takehiko Okamoto, Tosiro Kawai, and Masakazu Inoue, Nagoya, Japan, assignors to Toyo Rayon Kabushiki Kaisha, Tokyo, Japan, a corporation of Japan

No Drawing. Filed Jan. 22, 1968, Ser. No. 699,317
Claims priority, application Japan, Jan. 23, 1967, 42/4,194
Int. Cl. C08f *15/04, 15/22*
U.S. Cl. 260—80.81 6 Claims

In the preparation of a copolymer containing less than 40% by weight of a cyanated vinyl monomer by aqueous suspension polymerization, resistance to coloration is imparted to the copolymer by adding a saturated higher aliphatic alcohol having 12 to 18 carbon atoms to the polymerization system.

3,563,966

EPOXIDE-CURED ACRYLO-BUTADIENE COPOLYMERS

Robert Dean Lowrey, Hopkins, Minn., and William Edward Hunter, Huntsville, Ala., assignors to Thiokol Chemical Corporation, Trenton, N.J., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 644,954, Mar. 8, 1957. This application Jan. 6, 1958, Ser. No. 707,444
Int. Cl. C08f *15/00, 15/40*
U.S. Cl. 260—82.1 14 Claims

1. As a new composition of matter, the elastomeric reaction product of a polyepoxide and an acrylo-butadiene copolymer having free carboxyl groups.

2. The elastomeric reaction product of a polyepoxide and a copolymer of butadiene and acrylic acid.

6. The method of making an elastomer which comprises copolymerizing a diene selected from the group consisting of butadiene and lower alkyl substituted butadienes with an acrylic compound selected from the group consisting of acrylic acid, lower alkyl substituted acrylic acids and the esters of said acids to form a liquid copolymer with a liquid polyepoxide, and heating the mixture to cause said polyepoxide to react with said copolymer to form a rubber-like solid.

3,563,967

PROCESS FOR POLYMERIZING A MIXTURE OF BI-SECONDARY ALIPHATIC MONO-OLEFINS AND PRIMARY-SECONDARY MONO-OLEFINS

Yves Chauvin, Orsay, and Gilles Lefebvre, La Celle-St.-Cloud, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

No Drawing. Filed Sept. 13, 1967, Ser. No. 667,343
Claims priority, application France, Sept. 14, 1966, 76,410; Sept. 15, 1966, 76,556
Int. Cl. C08f *1/56, 3/02*
U.S. Cl. 260—88.2 5 Claims

A process for polymerizing a mixture of bi-secondary and primary secondary olefins. The mixture is first reacted in the presence of a catalytic mixture comprising one metal compound from groups IV*a* and V*a* and a group I*a*, II, III*b*, and IV*b* metal, hydride, or organometallic compound. Then adding a metal compound from group VI or VIII to the mixture and continuing the polymerization.

3,563,968

PROCESS FOR THE PREPARATION OF FUNCTIONAL POLYMERS FROM N-VINYL PYRROLIDONE

Ashot Merijan, Wayne, Eugene S. Barabas, Watchung, and Marvin M. Fein, Westfield, N.J., assignors to GAF Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 672,449, Oct. 3, 1967. This application Feb. 9, 1970, Ser. No. 10,024
Int. Cl. C08f *7/12*
U.S. Cl. 260—88.3 2 Claims

Functional homopolymers of heterocyclic N-vinyl monomers are obtained by the simultaneous polymerization and aminoalkylation or hydroxyalkylation of N-vinyl pyrrolidone.

3,563,969

PROCESS FOR PREPARATION OF VINYL BENZYL HALIDE POLYMERS AND THEIR QUATERNARY AMMONIUM SALTS

Bonnie F. Hartenstein, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Dec. 3, 1968, Ser. No. 780,881
Int. Cl. C08f *7/04, 27/02, 27/08*
U.S. Cl. 260—93.5 12 Claims

An improvement in a process for preparing and purifying vinyl benzyl halide polymers and the quaternary ammonium salts thereof, such as vinyl benzyl trimethylammonium chloride polymers, wherein the reaction product containing the vinyl benzyl halide polymer or the quaternary ammonium salt thereof is in the form of an emulsion having an organic liquid phase and an aqueous phase, said improvement comprising the steps of (1) dispersing in the emulsion up to about 100 p.p.m. based on the volume of the emulsion of a polysiloxane compound and (2) withdrawing the organic liquid layer from the aqueous layer.

3,563,970

OLEFIN POLYMERS HAVING A CONTROLLED GRANULOMETRY AND PROCESS FOR THEIR PREPARATION

Giorgio Leicht and Giancarlo Bizzarri, Terni, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Dec. 30, 1966, Ser. No. 605,966
Claims priority, application Italy, Jan. 4, 1966, 40/66
Int. Cl. C08f *3/08*
U.S. Cl. 260—93.7 3 Claims

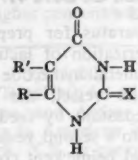
Process for controlling particle size distribution of isotactic polyolefins to eliminate "fines." Polymer is separated from non-isotactic fraction, dispersed in aqueous

solution of surface-active agent, and subjected to temperature of from about 100 to 160° C. at pressure of from about 2 to 50 atmospheres for from about 8 minutes to 3 hours.

3,563,971
NUCLEATION OF POLYPROPYLENE
Harold V. Wood and Terry D. Brown, Bartlesville, Okla., assignors to Phillips Petroleum Company, a corporation of Delaware
No Drawing. Filed Sept. 26, 1968, Ser. No. 762,970
Int. Cl. C08f 3/08, 3/10
U.S. Cl. 260—93.7 9 Claims

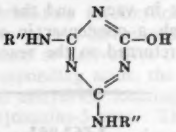
The crystal structure of propylene polymers is altered by the addition of a small concentration of a compound selected from those compounds of the formulas

(A)



wherein X is O or S, and R or R' is a hydrogen atom or a methyl, ethyl, propyl, isopropyl or a carboxyl group; or

(B)



wherein R'' is a hydrogen atom or an alkyl, aryl or cycloalkyl radical having from 1 to 12 carbon atoms therein.

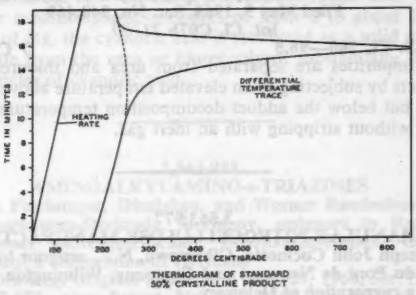
3,563,972
LOW MELT ELASTICITY COMPOSITION OF POLYPROPYLENE
Ronald C. Kowalski, Baytown, Tex., assignor to Esso Research and Engineering Company
No Drawing. Continuation of application Ser. No. 579,501, Sept. 15, 1966. This application Oct. 15, 1969, Ser. No. 866,769
Int. Cl. C08f 3/08
U.S. Cl. 260—93.7 2 Claims

A method for producing a polypropylene composition having a melt elasticity (swell) value between 1.5 and 3.0 comprises contacting the polypropylene with oxygen, heating the polypropylene in the feed-end of an extruder-reactor at temperatures between 600° and 1,000° F. and then cooling the polypropylene to a melt temperature not in excess of 600° F. A polypropylene composition having a melt elasticity (swell) of less than 3.0 has a molecular weight distribution which is very narrow as compared to commercial polypropylene compositions.

3,563,973
ARTICLES WITH POLYMERIC MEMORY AND METHOD OF CONSTRUCTING SAME
Sol J. Arditti, Plainview, N.Y., Souren Z. Avedikian, Short Hills, N.J., and Bruce S. Bernstein, Forest Hills, N.Y., assignors to Radiation Applications Incorporated, Long Island City, N.Y., a corporation of New York
No Drawing. Filed Mar. 4, 1965, Ser. No. 437,280
Int. Cl. C08f 3/04
U.S. Cl. 260—94.9 16 Claims

This disclosure relates to a novel process for forming polymeric structures, for example, for making toy figurines. In the process of this invention a polymeric structure comprising polymers or copolymers of ethylene or propylene are molded to a first desired shape; the structures are then irradiated to cross-link the polymer; said structure is then heated to reduce its crystallinity, whereupon it is readily collapsed and cooled to reduce its size several-fold. Subsequently the polymeric structure can be heated to substantially develop its original shape.

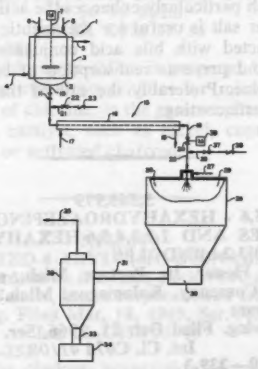
3,563,974
LINEAR POLYETHYLENE CHLORINATION
Carl R. Eckardt, Morris Plains, and William M. Bungo, Parsippany, N.J., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware
Continuation-in-part of application Ser. No. 354,345, Mar. 24, 1964. This application May 16, 1968, Ser. No. 742,107
Int. Cl. C08d 5/04
U.S. Cl. 260—94.9 4 Claims



THERMOGRAM OF STANDARD 50% CRYSTALLINE PRODUCT

A process for aqueous slurry chlorination of linear polyethylene of molecular weight below 500,000 whereby chlorinated polymer having 30%–50% by weight chlorine content is obtained. By following a specific schedule of reaction temperature vs. chlorine content of the polymer, good production rates are obtained and the resulting chlorinated polymer is fully soluble at room temperatures in aromatic hydrocarbon solvents and is highly flexible at low temperatures.

3,563,975
RECOVERY OF POLYMER POWDERS FROM PRESSURIZED SOLUTIONS OF POLYMER
Fredrick J. Zavasnik, % Phillips Petroleum Co., Bartlesville, Okla. 74003
Continuation-in-part of application Ser. No. 482,555, Aug. 25, 1965. This application June 12, 1969, Ser. No. 836,206
Int. Cl. C08f 1/88
U.S. Cl. 260—94.9 8 Claims



High density polymer powders are directly formed from a hot pressurized solution of a polymer by passing the

polymer solution to an elongated cooling means thereby indirectly cooling the solution to precipitate the polymer while maintaining the solution under sufficient pressure to prevent substantial vaporization of the solvent. The resulting slurry is intermittently removed from the elongated cooling means and introduced into a zone maintained at a pressure sufficiently lower than the pressure of the solution to cause vaporization of the solvent.

3,563,976

METHOD OF SEPARATING NON-ADDUCTED IMPURITIES FROM UREA AND THIOUREA ADDUCTS

King L. Mills, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware

Filed May 9, 1966, Ser. No. 548,469
Int. Cl. C07b *21/00*
U.S. Cl. 260—96.5 **7 Claims**

Impurities are separated from urea and thiourea adducts by subjecting to an elevated temperature above 150° F. but below the adduct decomposition temperature with or without stripping with an inert gas.

3,563,977

GRANULAR NITROCELLULOSE MANUFACTURE

Joseph John Cucinotta, Gibbstown, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed Feb. 28, 1968, Ser. No. 708,779
Int. Cl. C08b *5/00, 5/04, 19/00*
U.S. Cl. 260—223 **14 Claims**

In the process for the production of granular nitrocellulose by treating fibrous nitrocellulose in a bath of water and an active solvent, the improvement comprising adding dispersant to the bath.

3,563,978

POLYVALENT METAL COMPLEXES OF NATURAL POLYMERS

Irving L. Ochs, 28 Franklin St., Annapolis, Md. 21401

No Drawing. Filed May 15, 1968, Ser. No. 735,489
Int. Cl. C08b *11/20*
U.S. Cl. 260—232 **16 Claims**

In the present invention a polymer containing functional groups is reacted with a polyvalent metal cation in solution to form a salt of the polymer. Preferably, the polymer salt is separated from the solution by freeze-drying which particularly enhances the activity of the salt. The polymer salt is useful for therapeutic purposes since when contacted with bile acid conjugates, it binds the conjugate and prevents reabsorption of bile acid by the small intestine. Preferably the salt of the polymer contains an enteric coating.

3,563,979

1,2,3,4,5,6 - HEXAHYDROAZEPINO[4,3 - b]INDOLES AND 1,2,3,4,5,6-HEXAHYDROAZEPINO[3,2-b]INDOLES

Jackson B. Hester, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich., a corporation of Delaware

No Drawing. Filed Oct. 21, 1966, Ser. No. 588,315
Int. Cl. C07d *41/08*
U.S. Cl. 260—239.3 **11 Claims**

1, 2, 3, 4, 5, 6-hexahydroazepino[4,3-b] indoles, 1,2,3,4,5,6-hexahydroazepino[3,2-b]indoles and the corresponding acid addition salts thereof are disclosed. These compounds are useful for reducing anxiety and fighting behavior in animals and also for normalizing hyperactive and depressed mental states.

3,563,980

PROCESS OF PREPARING A MIXTURE OF A LACTAM AND AN ALKALI COMPOUND OF THIS LACTAM

Johannes van Mourik, Geleen, Johannes van Beveren, Sittard, and Johannes J. de Dilva, Heerlen, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed Apr. 5, 1968, Ser. No. 719,043
Claims priority, application Netherlands, Apr. 5, 1967, 6704865
Int. Cl. C07d *41/08*
U.S. Cl. 260—239.3 **3 Claims**

Process and apparatus for preparing a catalyst for the anionic polymerization of lactams, in which a lactam and an alkali metal hydroxide are continuously fed into a first reaction vessel, the liquid level in said vessel being kept constant by feeding a portion of the reaction mixture into a second vessel and the liquid level in said second vessel being kept constant by discharging a continuous stream of the reaction mixture from said vessel. The water formed in the reaction vessels is evaporated by heating in vacuo and the vapour thus formed is passed through a condenser in which the lactam is condensed and returned to the reaction vessels.

3,563,981

ALKYLIDENE AROMATIC-AMINOMETHYLENE-MALONATES AND THEIR PREPARATION

George Y. Lesher, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 640,359, May 22, 1967, which is a continuation-in-part of application Ser. No. 464,850, June 17, 1965. This application June 10, 1968, Ser. No. 735,567
Int. Cl. C07d *33/20*
U.S. Cl. 260—240.3 **34 Claims**

Alkylidene Ar-aminomethylenemalonates, where Ar is an aromatic radical having one or two aromatic rings which can be benzenoid or five- or six-membered heteroaromatic, are prepared by reacting the appropriate aromatic-amine with a mixture of a trialkyl orthoformate or trialkyl orthoacetate and an alkylidene malonate. The alkylidene Ar-aminomethylenemalonates are then cyclized by heating to provide an improved process for preparing various heterocyclic compounds, e.g., a 4-hydroxyquinoline from an alkylidene anilinomethylenemalonate, a 4H-pyrido[1,2 - a]pyrimidin - 4 - one from an alkylidene 2-pyridylaminomethylenemalonate, a 4H-pyrimido[1,2 - a] pyrimidine-4-one from an alkylidene 2-pyrimidylaminomethylenemalonate. The cyclized products are useful as intermediates for the preparation of antimalarials and anti-inflammatory agents.

3,563,982

INSECT CONTROL PROCESS WITH SYNTHETIC HORMONES

William S. Bowers, Bowie, Md., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Jan. 2, 1969, Ser. No. 788,651
Int. Cl. C07d *17/00, 21/00*
U.S. Cl. 260—240 **32 Claims**

Methylenedioxybenzyloxy and methylenedioxyphenoxy ethers of straight chain terpenoid compounds and their epoxides were synthesized and found to mimic the juvenile hormones of insects and be extremely effective as insect control agents.

3,563,983

3-(BENZENE-FUSED HETEROCYCLIC THIOL) SUBSTITUTED SYNDNONECEPHALOSPORIN COMPOUNDS AND PROCESS FOR PREPARATION THEREOF

Sueo Atarashi, Kyoto, Susumu Horibe, Osaka, Masashi Mera, Amagasaki, and Ritsuko Nakagawa, Akashi, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

No Drawing. Filed Oct. 31, 1967, Ser. No. 679,519
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 6 Claims

The compounds of this invention are 3-(benzene-fused heterocyclic thiol) substituted 7-sydnonecephalosporin compounds. These compounds manifest significant activity against a wide variety of microorganisms including both gram-positive and gram-negative bacteria, and also are excreted in bile at a higher concentration.

3,563,984

OXAZOLO[2,3-b]PYRIMIDO[4,5-d][1,3]OXAZINONES

Dong H. Kim, Wayne, and Arthur A. Cantilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed Dec. 20, 1968, Ser. No. 785,768
Int. Cl. C07d *85/48*
U.S. Cl. 260—244 7 Claims

4-(substituted)-pyrimidine carboxylic acid esters are produced by reaction of a 5-carbethoxy-4-chloropyrimidine with alkanolamine or derivatives thereof. After hydrolysis to the corresponding acids, the compounds are treated with an acid anhydride forming oxazolo[2,3-b] pyrimido[4,5-d][1,3]oxazine-5-ones. The latter compounds are central nervous system depressants.

3,563,985

PROCESS FOR PREPARING CERTAIN ACYLAMINOISOTHIAZOLES

Gert P. Volpp, Princeton, and William A. Hills, Trenton, N.J., assignors to FMC Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,796
Int. Cl. C07d *91/12*
U.S. Cl. 260—247.1 5 Claims

Ureas, carbamates and thiocarbamates having a 3-or-5-isothiazolyl ring attached to one of the nitrogen atoms thereof are prepared by reacting a 3-or-5-isothiazolyl isocyanurate formed by pyrolysis of the 3-or-5-isothiazoloyl azide with the corresponding amine, alcohol or thiol and isolating the resulting product.

3,563,986

4 - PHTHALIMIDO - N - HETEROCYCLIC AMINO METHYL OR PIPERIDINO HYDRAZINO PIPERIDINE DIONES 2,6

Ernst Frankus, Dorfstrasse 14, Schleckheim, near Aachen, Germany; Heinrich Mueckter, Eupener Str. 291, Aachen, Germany; and Siegfried Herrling, Auf der Liester 8; Franz Otto, Galmeistrasse 57; and Horst Boehlke, Trockener Weiher 33, all of Stolberg, Rhineland, Germany

No Drawing. Filed May 9, 1966, Ser. No. 548,426
Claims priority, application Germany, Oct. 12, 1965, P 15 45 706.4; Oct. 13, 1965, P 15 45 707.5; Austria, Oct. 15, 1965, A 9,341/65
Int. Cl. C07d *87/46*
U.S. Cl. 260—247.1 8 Claims

Dicarboxylic acid imides which carry in 4-position of their ring structure an acylated amino or imino group and are substituted at the imido group by basically substituted methyl have valuable pharmacological properties, such as anti-tumor, immuno-suppressive, and sedative properties. Examples of such compounds are 4-phthalimido piperidinediones-2,6 substituted in 1-position by a morpholino, piperidino, or pyrrolidino methyl group or by an N-methyl-N-morpholino or N-methyl-N-piperidino amino methyl group; 4-(3',5'-dithia-3',4',5',6'-tetrahydrophthalimido) piperidinedione-2,6 substituted in 1-position by a morpholino, piperidino, or pyrrolidino methyl group, and others.

3,563,987

PREPARATION OF CYANURIC ACID

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, a corporation of Delaware

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,334
Int. Cl. C07d *55/36*
U.S. Cl. 260—248 6 Claims

A highly-pure cyanuric acid is produced by heating urea or biuret in an inert solvent therefor, at temperatures of at least about 180° C., and preferably about 200–250° C., under subatmospheric pressures of from 0 to about 250 mm. of Hg; the cyanuric acid is recovered as a solid precipitate from the urea or biuret solvent substantially free of amides of cyanuric acid.

3,563,988

AMINOALKYLAMINO-s-TRIAZINES

Hans Feichtinger, Dinslaken, and Werner Raudenbusch, Oberhausen-Sterkrade, Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen-Holten, Germany, a corporation of Germany

No Drawing. Original application Nov. 29, 1966, Ser. No. 597,571, now Patent No. 3,413,268, dated May 3, 1968. Divided and this application Apr. 1, 1968, Ser. No. 753,317
Claims priority, application Germany, Dec. 3, 1965, R 42,127; Dec. 30, 1965, R 42,340
Int. Cl. C07d *87/40*
U.S. Cl. 260—247.5 13 Claims

The invention is concerned with novel aminoalkylamino-s- triazines prepared from mono-s-triazines and aldehydes, especially isobutyraldehyde, and the preparation of the hereinbefore mentioned starting materials in a single reaction stage. The new compounds are useful as hardening agents for epoxy resins.

3,563,989

PROCESS FOR THE PRODUCTION OF TETRACHLOROPYRIMIDINE

Hans Holtschmidt, Leverkusen, Herbert Schwarz, Opladen, and Fritz Döring, Odenthal-Globusch, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany

No Drawing. Filed Dec. 4, 1968, Ser. No. 781,278
Claims priority, application Germany, Dec. 14, 1967, P 16 70 961.8
Int. Cl. C07d *51/36*
U.S. Cl. 260—251 4 Claims

2,4,5,6-tetrachloropyrimidine is prepared by heating a mono-, di-, or trichloropyrimidine or mixtures thereof with an excess of chlorine, in the gaseous phase and in the presence of a catalyst, such as nickel, cupric chloride, ferric chloride or activated charcoal.

3,563,990

1-SUBSTITUTED-4-ARYL-2(1H)-QUINAZOLINONES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz-Wander, Inc., a corporation of Delaware

No Drawing. Filed Mar. 18, 1969, Ser. No. 808,338
Int. Cl. C07d *51/48*
U.S. Cl. 260—251 7 Claims

The invention discloses preparation of 1-substituted-4-aryl-2(1H)-quinazolinones from their corresponding 1-substituted-4-aryl - 5,6,7,8 - tetrahydro-2(1H)-quinazolinones.

3,563,991
1-OXO-1,2,3,4-TETRAHYDROPHENAZINE-5,10-DIOXIDES

James David Johnston, Allendale, N.J., assignor to Chas. Pfizer & Co. Inc., New York, N.Y., a corporation of Delaware

No Drawing. Application Dec. 18, 1968, Ser. No. 798,546, now Patent No. 3,507,870, which is a division of application Ser. No. 587,420, Oct. 18, 1966, now Patent No. 3,480,713, which in turn is a continuation-in-part of application Ser. No. 502,602, Oct. 22, 1965. Divided and this application July 10, 1969, Ser. No. 840,817
Int. Cl. C07d *51/80*
U.S. Cl. 260—267 9 Claims

A series of 1-oxo-1,2,3,4-tetrahydrophenazine-5,10-dioxides and the non-toxic salts thereof useful in controlling chronic respiratory disease in poultry and in promoting growth and improving feed efficiency of animals in general.

3,563,992
1,4-DIAZA-BICYCLO[4,3,0]NONANE-2,5,9-TRIONES

Michael R. Harnden, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill., a corporation of Illinois

No Drawing. Continuation-in-part of application Ser. No. 593,691, Nov. 14, 1966. This application Oct. 31, 1967, Ser. No. 679,524
Int. Cl. C07d *51/72*
U.S. Cl. 260—268 9 Claims

Novel 1,4-diaza-bicyclo [4,3,0] nonane-2,5,9-triones are obtained by two synthetic routes. The first involves cyclization of α-aminoalkanoyl-glutamic acids to 3,6-dioxo-2-piperazine-propionic acids which undergo a second cyclization upon refluxing with acid anhydride. In the second route, compounds of the novel bicyclic system were obtained by direct cyclization of N-acetyl-α-aminoalkanoyl-glutamic acid. These compounds have been found effective as central nervous system stimulants and depressants.

3,563,993
10-(1-PIPERAZINO)-10,11-DIHYDRO-DIBENZO[b,f]THIEPINS

Walter Schindler, Riehen, near Basel, Erich Schmid, Basel, and Armin Zust, Birsfelden, near Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y., a corporation of New York

No Drawing. Filed Feb. 17, 1969, Ser. No. 799,955
Claims priority, application Switzerland, Dec. 4, 1968, 18,085/68
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 3 Claims

8 - methoxy - and 8 - methylthio - 10 - (1 - piperazinyl) - 10,11 - dihydro - dibenz[b,f]thiepin and the pharmaceutically acceptable acid addition salts thereof, have a depressant effect on the central nervous system; pharmaceutical compositions comprising these compounds and methods of producing a depressant effect in warm-blooded animals are provided.

3,563,994
ORTHO-SUBSTITUTED 2-PHENYL-IMINO-1-AZA-CYCLOALKANES

Hartmund Wollweber and Rudolf Hiltmann, Wuppertal-Elberfeld, and Kurt Stoepel, Wuppertal-Vohwinkel, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 11, 1968, Ser. No. 720,475
Claims priority, application Germany, Apr. 24, 1967, F 52,224
Int. Cl. C07d *29/28*
U.S. Cl. 260—293 41 Claims

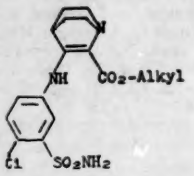
There are provided 2-phenyl-imino-1-aza-cycloalkanes having an o-substituent on the phenyl nucleus comprising alkyl, alkoxy, halogen, trifluoromethyl, alkanoyl and mercaptoalkyl, wherein alkyl, alkoxy and alkanoyl have 1–4 carbon atoms. The compounds are useful for their blood pressure depressant activity and their CNS damping effect. They can be prepared by reacting substituted anilines with selected lactams. A representative compound is 2-(2',6'-dimethylphenyl)-imino-1-aza-cyclopentane and its HCl acid addition salt.

3,563,995
ALKYL ESTERS OF 1-AZABICYCLO[2.2.2]OCT-2-ENE-3-(4 - CHLORO-3-SULFAMOYLANILINO)-2-CARBOXYLIC ACID

Ian Wellings, 1713 Shadybrook Road, Wilmington, Del. 19803

No Drawing. Filed Apr. 17, 1969, Ser. No. 817,182
Int. Cl. C07d *39/06*
U.S. Cl. 260—293.4 5 Claims

Compounds useful as plant growth regulants of the formula:



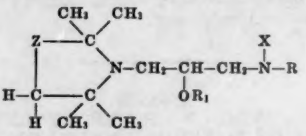
Typical is 1-azabicyclo[2.2.2]oct-2-ene-3-(4-chloro-3-sulfamoylanilino)-2-carboxylic acid, ethyl ester.

3,563,996
PIPERIDINE DERIVATIVES

Andrea Pedrazzoli and Gianmario Cipelletti, Milan, Italy, assignors to Societe d'Etudes de Recherches et d'Applications Scientifiques et Medicales E.R.A.S.M.E., Paris, France, a French society

No Drawing. Filed Aug. 21, 1967, Ser. No. 661,811
Claims priority, application Great Britain, Aug. 23, 1966, 37,826/66
Int. Cl. C07d *29/28*
U.S. Cl. 260—294.3 6 Claims

The disclosure is of heterocyclic compounds derived from arylamino-propane-2-ol and a method of preparing them, the compounds having the general formula:



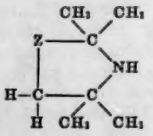
wherein:

Z is the group $—CH_2—CH_2—$ or the group $—CH=CH—$

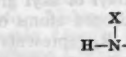
R is a substituted or unsubstituted phenyl, benzyl or phenylethyl radical,

R_1 is either a hydrogen atom, in which case X is a hydrogen atom or a CH_3 radical, or

R_1 is a COR_2 group, COR_2 being a substituted or unsubstituted phenoxyacetic or aromatic acid residue or a phenylthioacetic acid residue which may or may not be substituted in the ring, in which case X is a CH_2 radical, The method comprises reacting a compound of the formula:



with epichlorhydrin, reacting the product obtained with an amine of the formula:



X and R being the substituents defined above, and then reacting the product obtained with an acid chloride of the formula:

R_2COCl

The products of the invention are stable to light and to heat, they have a low toxicity and a remarkable pharmacological activity, being antihistaminic, myolitic, anolgesic, anti-inflammatory, antipyretic, and psychotropically tranquilising and, particularly, local anesthetic.

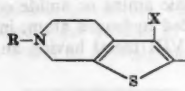
3,563,997

CERTAIN THIENO(2,3-c)PYRIDINES

Michio Nakanishi and Tetsuya Tahara, Nakatsu, Oita, Hiroshi Imamura, Ichikawa, Chiba, and Yutaka Maruyama, Tokyo, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Higashiku, Osaka, Japan

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,218
Claims priority, application Japan, Dec. 4, 1967, 42/78,078
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 **14 Claims**

Thienopyridine derivatives of the formula



wherein R is H, acetyl, allyl, 2-propynyl, 3-chloro-2-hydroxypropyl, carboxymethyl, alkyl of 1 to 8 carbon atoms, alkoxycarbonyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms, hydroxyalkyl wherein the alkyl moiety contains from 1 to 4 carbon atoms, alkoxycarbonylalkyl wherein the alkoxy and alkyl moieties each independently contains from 1 to 4 carbon atoms, phenethyl, benzyl, mono-, di- or tri-substituted benzyl or benzoyl in which the substituents are Cl, methyl or methoxy, and X is cyano, carbamoyl or alkoxycarbonyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms, are analgesic and anti-inflammatory agents.

3,563,998

2 - [4 - (2',6' - DIPHENYL - 4 - PYRIDYL)PHENOXY]- AND 2 - [4 - (4',6' - DIPHENYL - 2 - PYRIDYL)PHENOXY] LOWER ALIPHATIC MONOCARBOCYLIC ACIDS AND ESTERS

Rudolf G. Griot, Florham Park, N.J., assignor to Sandoz-Wander, Inc., a corporation of Delaware

No Drawing. Filed July 8, 1968, Ser. No. 743,041
Int. Cl. C07d *31/34*
U.S. Cl. 260—295 **7 Claims**

Aliphatic acid derivatives, e.g., 2-[4-(2',6'-diphenyl-4-pyridyl)phenoxy]-, and 2-[4-(4',6'-diphenyl - 2 - pyridyl) phenoxy] lower aliphatic monocarbocylic acids. These compounds are useful as hypolipidemic agents.

3,563,999

CERTAIN PERFLUOROALKYLENE OXY-ALKYLENE ESTERS OF PYRIDINIUM CARBOXYLATES

Louis G. Anello, Basking Ridge, and Richard F. Sweeney, Dover, N.J., assignors to Allied Chemical Corporation, New York, N.Y., a corporation of New York

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,848
Int. Cl. C07d *31/34*
U.S. Cl. 260—295 **7 Claims**

Quaternized haloalkyl esters of fluorocarbon alcohols having a polyfluoroisoalkoxyalkyl tail wherein an ether oxygen atom links a fluorinated carbon atom connected to two fluoroalkyl groups and at least one —CF_2— group. These compounds impart oil and water resistance to textiles.

3,564,000

PROCESS FOR PREPARING 3-CHLORO-4-HYDROXY-1,2,5-THIADIAZOLE DERIVATIVES

Leonard M. Weinstock, Rocky Hill, N.J., assignor to Merck & Co., Inc., Rahway, N.J., a corporation of New Jersey

No Drawing. Original application Oct. 15, 1965, Ser. No. 496,699, now Patent No. 3,419,573, dated Dec. 31, 1968. Divided and this application Jan. 17, 1968, Ser. No. 723,635
Int. Cl. C07d *91/68*
U.S. Cl. 260—302 **4 Claims**

3-chloro-1,2,5-thiadiazoles substituted at the 4-position with a hydroxy or hydrocarbonoxy function are synthesized directly from open chain cyanoformamide or an alkyl cyanoformimidate by treating the latter with sulfur mono- or dichloride. These compounds are employed as intermediates in the synthesis of sulfathiadiazoles having antiparasitic and antibacterial activity.

3,564,001

METHOD FOR PRODUCTION OF BENZOTRIAZOLE

John W. Long III, Sylvania, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio, a corporation of Ohio

No Drawing. Filed Feb. 19, 1968, Ser. No. 706,641
Int. Cl. C07d *55/04*
U.S. Cl. 260—308 **12 Claims**

A method for the preparation of benzotriazole which involves acid treatment of benzotriazole reaction mixtures combined with subsequent purifying steps including a distillation to yield a product of high quality useful in the photographc industry, yet which is relatively inexpensive to make when compared to prior art processes.

3,564,002

CERTAIN 2-HALOALKANOYLAMINO-5-HALOALKYL-1,3,4-THIADIAZOLES

William Alan Remers, Suffern, and Gabriel Joseph Gibs, Pearl River, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn., a corporation of Maine

No Drawing. Filed Oct. 11, 1968, Ser. No. 766,986
Int. Cl. C07d *91/34*
U.S. Cl. 260—306.8 **4 Claims**

The preparation of 2-amino or substituted amino-5-substituted thiadiazoles are described. They are useful in the treatment of ascariasis and as intermediates for the preparation of, for example, 2-(2-amino-5-1,3,4-thiadiazolyl)-1-methyl-5-nitroimidazole which has antiprotozoal and antibacterial properties.

3,564,003

2,2'-BIS(HEPTAFLUOROPROPYL)-5,5'-BIBENZOXAZOLE

Charles D. Burton and Norman L. Madison, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Feb. 5, 1968, Ser. No. 702,777
Int. Cl. C07d *85/48*
U.S. Cl. 260—307 **4 Claims**

A novel compound 2,2' - bis(heptafluoropropyl)-5,5'-bibenzoxazole and the manner of its preparation. The compound is prepared by reacting 3,3'-diaminobiphenol in a solvent or carrier liquid with methylperfluorobutyrimidate in the presence of an aliphatic carboxylic acid as reaction promoter. Alternatively, the compound can be

prepared by heating 3,3'-bis(heptafluorobutyramido)-4,4'-dihydroxybiphenyl in the presence of a dehydrating agent to effect cyclization. The present novel compound is suitable for use as an antiplasticizer.

3,564,004

PROCESS FOR THE PREPARATION OF 2-(1'-H-HALOGENOALKYL)-Δ²-OXAZOLINES

Otto Scherer, Bad Soden, Taunus, Helmut Hahn and Robert Hartwimmer, Burghausen, Salzach, Siegfried Rebsdat, Altötting, and Erich Schulerer, Burghausen, Salzach, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany, a corporation of Germany

No Drawing. Filed June 30, 1969, Ser. No. 837,919
Claims priority, application Germany, July 4, 1968, P 17 70 789.0
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 **6 Claims**

2-(1'-H-halogenoalkyl)-Δ²-oxazolines are obtained by reacting 1,1-difluoroethylenes with ethanolamine. The products are useful as monomers or comonomers for the preparation of poly-N-vinyl carboxylic acid amides, capable of rendering fibrous materials water- and oil-repellent.

3,564,005

METHOD FOR PREPARING SUBSTITUTED TETRAZOLE

Hermann S. Haiss, Indian Head, Md., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Feb. 8, 1968, Ser. No. 707,371
Int. Cl. C07d *55/56*
U.S. Cl. 260—308 **7 Claims**

A method for converting the 1-isomer of methyl-5-vinyl tetrazole into the useful energetic plasticizer, 5-(β-hydroxyethyl)-1-methyl tetrazole whereby the 1-isomer is reacted with a solution of a strong base.

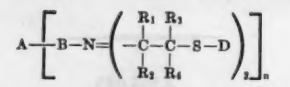
3,564,006

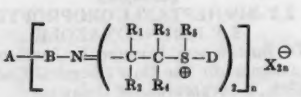
PHTHALOCYANINE DYESTUFFS CONTAINING N,N-BIS(DIMETHYL - SULPHONIOETHYL)AMINOSULPHONYL GROUPS

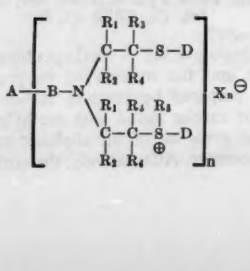
Djavad Razavi, Paris, France, assignor, by mesne assignments, to Ugine Kuhlmann, Paris, France, a corporation of France

No Drawing. Filed Oct. 25, 1966, Ser. No. 589,239
Claims priority, application France, Oct. 29, 1965, 36,715
Int. Cl. C09b *47/04;* **D06p** *1/14*
U.S. Cl. 260—314.5 **1 Claim**

Dyestuffs which have one of the following formula:







in which A represents the residue of a dyestuff molecule, B represents a bridging linkage, D represents a substituted or unsubstituted alkyl, aralkyl or aryl group, R_1, R_2, R_3 and R_4 each represent hydrogen atoms or substituted or unsubstituted alkyl groups, R_5 represents an alkyl or aralkyl group, X represents a monovalent anion and *n* is an integer. These dyestuffs are particularly useful for the colouration of textile fibres such as wool silk, polyamides and natural or rengerated cellulose in shades fast to wet tests.

3,564,007

PRODUCTION OF UNSATURATED NITROGEN-CONTAINING COMPOUNDS

Eric W. Stern, Mountainside, and Marshall L. Spector, Livingston, N.J., assignors, by mesne assignments, to W. R. Grace & Co., New York, N.Y., a corporation of Connecticut

No Drawing. Continuation-in-part of application Ser. No. 78,111, Dec. 23, 1960. This application May 19, 1964, Ser. No. 368,681
Int. Cl. C07c *87/24, 103/30;* **C07d** *27/68*
U.S. Cl. 260—315 **30 Claims**

Process for preparing N-substituted alpha,beta-ethylenically unsaturated compounds which comprises reacting an ethylenically unsaturated compound having at least one

group with an organic amine or amide compound having at least one N-bonded hydrogen atom; in the presence of a salt of a Group VIII metal having an atomic number of at least 44.

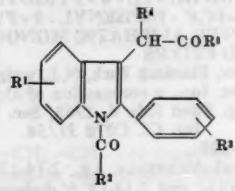
3,564,008

PROCESS FOR PREPARING 1-ACYL-2-PHENYL-3-INDOLYLALIPHATIC ACID DERIVATIVES

Hisao Yamamoto, Nishinomiya-shi, Yasushi Nakamura, Hirakata-shi, Masaru Nakao, Osaka, Toshio Atsumi, Takarazuka-shi, and Tsuyoshi Kobayashi, Minoo-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan, a corporation of Japan

No Drawing. Filed Jan. 3, 1968, Ser. No. 695,332
Claims priority, application Japan, Jan. 14, 1967, 42/2,841
Int. Cl. C07d *27/56*
U.S. Cl. 260—326.13 **9 Claims**

A 1-acyl-2-phenyl-3-indolylaliphatic acid derivative represented by the formula,



wherein R^1 is a hydrogen atom, a lower alkoxy group, etc.; R^2 is a halogen- or lower alkyl-substituted phenyl group, etc.; R^3 is a hydrogen atom or a lower alkyl group, etc.; R^4 is a hydrogen atom or a lower alkyl; and R^5 is a hydroxy group, etc., is obtained by reacting a corresponding N^1-acyl phenylhydrazine derivative or a mineral acid salt thereof with a corresponding phenyl ketone compound.

The typical examples thereof are 1-(p-chlorobenzoyl)-2-phenyl 5-methoxy - 3 - indolylacetic acid and 1-(p-methylbenzoyl)-2-phenyl - 5 - methoxy - 3 - indolylacetic acid.

The compounds thus obtained have remarkable anti-inflammatory, analgesic and antipyretic actions.

3,564,009

PROCESS FOR PRODUCING 1-ACYLINDOLE DERIVATIVES

Hisao Yamamoto, Nishinomiya-shi, Masaru Nakao, Osaka, and Toshio Atsumi, Takarazuka-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan, a corporation of Japan

No Drawing. Filed Dec. 28, 1966, Ser. No. 605,171
Claims priority, application Japan, Jan. 13, 1966, 41/1,916; Mar. 15, 1966, 41/16,237; Apr. 5, 1966, 41/21,646; Apr. 7, 1966, 41/22,178; July 14, 1966, 41/46,335
Int. Cl. C07d 27/56
U.S. Cl. 260—326.16 8 Claims

A process for the preparation of certain N-acylindoles by the reaction of an N'-acylhydrazine with a ketone compound.

3,564,010

GUANIDINO UREIDO AND THIOUREIDO-Δ^1-PYRROLINES

Hermann Bretschneider, Rudolf Franzmair, Wilhelm Klotzer, and Bela Schmidt, Innsbruck, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J., a corporation of New Jersey

No Drawing. Filed Feb. 23, 1968, Ser. No. 707,484
Claims priority, application Switzerland, Feb. 27, 1967, 2,905/67
Int. Cl. C07d 27/14
U.S. Cl. 260—326.3 21 Claims

Guanidino or ureido or thioureido pyrrolines (A) prepared from 2-amino-Δ^1-pyrrolines (B). Both (A) and (B) lower the blood sugar content in warm blooded animals; hence, are useful as hypoglycemic agents.

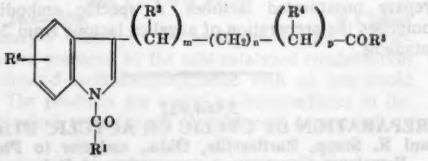
3,564,011

METHOD FOR PREPARING 1-ACYL-3-INDOLYL ALIPHATIC ACID DERIVATIVES

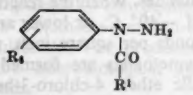
Hisao Yamamoto, Nishinomiya-shi, and Masaru Nakao, Osaka, Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan, a corporation of Japan

No Drawing. Filed Dec. 28, 1966, Ser. No. 605,154
Claims priority, application Japan, Jan. 12, 1966, 41/1,999; Apr. 28, 1966, 41/27,300, 41/27,301; May 2, 1966, 41/28,125; May 4, 1966, 41/28,400; June 21, 1966, 41/40,591; July 8, 1966, 41/44,723, 41/44,724; Aug. 19, 1966, 41/54,674, 41/54,675
Int. Cl. C07d 27/56
U.S. Cl. 260—326.13 13 Claims

Novel 1-acyl-3-indoyl aliphatic acid derivatives having excellent anti-inflammatory activity with low toxicity and having the formula:



wherein R^1 is an alkyl, chlorine substituted alkyl or alkenyl group and has up to 10 carbon atoms, R^2 and R^3 are, respectively, a hydrogen atom or a lower alkyl group, R^4 is a hydrogen atom, a carboxy group or an alkoxylcarbonyl group, R^5 is a hydroxy group, R^6 is an alkyl (C_1–C_3) group, an alkoxy (C_1–C_3) group, an alkyl (C_1–C_3) thio group, a chlorine atom or a hydrogen atom, m and p are, respectively, 0 or 1, and n is 0 or an integer of from 1 to 3, are produced by reacting an acylated phenylhydrazine compound of the formula:



wherein R^1 and R^6 have the same meanings as defined above, with an aliphatic acid compound of the formula:

wherein R^2, R^3, R^4, R^5, m, n and p have the same meanings as defined above.

3,564,012

5,7-DIMETHOXY-TRYPTAMINES

James M. McManus, Old Lyme, Conn., assignor to Chas. Pfizer & Co., Inc., New York, N.Y., a corporation of Delaware

No Drawing. Filed Mar. 29, 1968, Ser. No. 717,409
Int. Cl. C07d 27/56
U.S. Cl. 260—326.15 8 Claims

Certain novel 5,7-dimethoxytryptamine compounds have been prepared and found to be useful as oral hypoglycemic agents. Typical member compounds include 3-(2-aminoethyl)-5,7-dimethoxyindole, 3-(2-aminopropyl)-5,7-dimethoxyindole and 3-(2-aminobutyl)-5,7-dimethoxyindole, and their pharmaceutically acceptable acid addition salts. Alternate routes of preparation for these compounds are presented and some of these routes are described in detail.

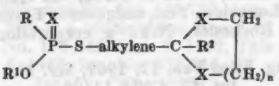
3,564,013

PHOSPHONATED CYCLIC MERCAPTAL

Edward Nelson Walsh, Chicago Heights, Ill., assignor to Stauffer Chemical Company, New York, N.Y., a corporation of Delaware

No Drawing. Filed July 9, 1964, Ser. No. 381,509
The portion of the term of the patent subsequent to Feb. 16, 1986, has been disclaimed and dedicated to the Public
Int. Cl. C07d 89/06
U.S. Cl. 260—327 1 Claim

Phosphonated cyclic mercaptals and mercaptoles corresponding to the formula



in which alkylene is a divalent saturated aliphatic radical having from 1 to 3 carbon atoms; R and R^1 are lower alkyl and phenyl; the groups represented by X are independently sulfur or oxygen; R^2 is an alkyl from 1 to 3 carbons or hydrogen and n is an integer from 1 to 2, inclusive. The above compounds are effective insecticides and miticides. Representative compounds are 2-methyl-2-(O-ethyl ethylphosphorodithiomethylene)-1,3-oxathiolane, 2-methyl-2-(O-ethyl ethylphosphorodithiomethylene)-1,3-dithiolane, 2-methyl-2-(O-ethyl methylphosphorodithiomethylene)-1,3-dithiolane, and 2-methyl-2-(O-ethylphenylphosphonodithiomethylene)-1,3-dithiolane.

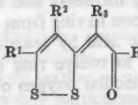
3,564,014

DITHIOLE COMPOUNDS AND PREPARATION

Erwin Klingsberg, Geneva, Switzerland, assignor to American Cyanamid Company, Stamford, Conn., a corporation of Maine

No Drawing. Filed Mar. 12, 1968, Ser. No. 712,383
Int. Cl. C09b 23/00; C07d 71/00; C09d 49/00
U.S. Cl. 260—327 11 Claims

3-chloro-1,2-dithiolium salts such as 3-chloro-1,2-benzodithiolium chloride condense with aliphatic, cycloaliphatic or aromatic ketones having a free alpha position to give 3-(2-oxoethylidene)-3H-1,2-dithiole compounds of the formula



where R^1 and R^2 typically form a benzo or naphtho ring, R^3 is alkyl or benzoyl; R^4 is alkyl or phenyl; and where R^3 and R^4 typically also may together form a cyclopentyl or cyclohexyl ring. The products are dyestuffs and intermediates for the preparation of thiothiophthenes, another class of dyes.

3,564,015

DERIVATIVES OF DIBENZOCYCLOHEPTENES

Marcia E. Christy, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J., a corporation of New Jersey

No Drawing. Filed Aug. 20, 1968, Ser. No. 753,867
Int. Cl. C07d 7/20, 71/00
U.S. Cl. 260—327 32 Claims

Novel 10,11-dihydro-5,10-epoxy - 5H - dibenzo[a,d]-cycloheptenes, wherein the moiety substituted at the 5-position is a primary, secondary or tertiary-aminomethyl group, possessing anti-arrhythmic activity are disclosed, as well as intermediates and processes for their preparation and use.

3,564,016

METHOD OF DECARBONYLATION

Karl Schoen, Kew Gardens, and Michael Finizio, Brooklyn, N.Y., assignors to Endo Laboratories Inc., Garden City, N.Y., a corporation of New York

No Drawing. Continuation-in-part of application Ser. No. 468,633, June 30, 1965. This application Mar. 7, 1968, Ser. No. 711,195
Int. Cl. C07d 27/22
U.S. Cl. 260—313.1 14 Claims

Di- and tri-substituted pyrroles may be prepared by decarbonylating of the corresponding mono- and di-carboxylic acid esters and mono- and di-ketones by warming the esters of ketones with phosphoric acid.

3,564,017

BICYCLIC FURODIOXOLES

Alfred G. Robinson, Alden E. Blood, and Hugh J. Hagemeyer, Jr., Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey

No Drawing. Filed Feb. 12, 1969, Ser. No. 798,803
Int. Cl. C07d 13/08
U.S. Cl. 260—340.9 10 Claims

Dialkyl-substituted derivatives of acetaldehyde react exothermically with glyoxal in the presence of an aqueous base to form bicyclic furodioxole ring compounds. For example, isobutyraldehyde and glyoxal in the presence of aqueous sodium carbonate react to form tetrahydro-2-isopropyl-6,6-dimethylfuro[2,3-d]-1,3-dioxol-5-ol. The bicyclic furodioxoles are valuable intermediates in the synthesis of polyols, which are themselves useful, for example, as intermediates in the preparation of alkyd resins, plasticizers for polyvinyl chloride compositions and as humectants.

3,564,018

PRODUCTION OF LACTONES HAVING FROM SIX TO THIRTEEN RING MEMBERS AND ISOBUTYRIC ACID

Toni Dockner, Meckenheim, and Rolf Platz, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Jan. 14, 1969, Ser. No. 791,151
Claims priority, application Germany, Jan. 30, 1968, P 16 43 750.6
Int. Cl. C07d 7/06, 9/00; C07c 51/24
U.S. Cl. 260—343 11 Claims

An improved process for the production of lactones having six to thirteen ring members and isobutyric acid by reaction of a cyclic ketone having from five to twelve ring members and isobutyric acid by reaction of a cyclic ketone having from five to twelve ring members and isobutyraldehyde with molecular oxygen or a gas containing the same, the improvement consisting in carrying out the reaction without using a catalyst. Lactones are used in the production of polyester.

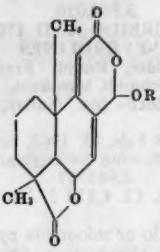
3,564,019

TETRACYCLIC LACTONE ANTIFUNGAL AGENTS

Chester Eric Holmlund, Silver Spring, Md., Ralph Henry Evans, Jr., Rivervale, N.J., and George Alfred Ellestad, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn., a corporation of Maine

No Drawing. Filed May 22, 1969, Ser. No. 827,062
Int. Cl. C07d 21/00
U.S. Cl. 260—343.3 4 Claims

The new compounds of Formula I:



wherein R is hydrogen, acetyl or methyl. All the compounds of this invention have antifungal activity. Compounds represented by Formula I wherein R is hydrogen or methyl are prepared by the cultivation under controlled aerobic conditions of Acrostalagmus species Z1271. The compound of Formula I wherein R is acetyl is prepared by acetylation of the compound of Formula I wherein R is hydrogen.

3,564,020

PREPARATION OF ANGELICA LACTONE

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif., a corporation of California

Filed July 17, 1968, Ser. No. 745,351
Int. Cl. C07d 5/06
U.S. Cl. 260—343.6 6 Claims

Conjugated diolefins bearing a halogen on an unsaturated carbon are reacted with carbon monoxide and water in the presence of a Group VIII noble metal catalyst to prepare unsaturated lactones. A specific embodiment comprises the preparation of angelica lactone from 2-halo butadiene.

3,564,021

PREPARATION OF CYCLIC OR ACYCLIC ETHERS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware

No Drawing. Continuation-in-part of abandoned application Ser. No. 682,970, Nov. 14, 1967, which is a continuation-in-part of abandoned application Ser. No. 602,553, Dec. 19, 1966. This application May 1, 1969, Ser. No. 821,071
Int. Cl. C07c 43/12; C07d 7/14
U.S. Cl. 260—345.1 23 Claims

A process of preparing cyclic or acyclic ethers by reacting certain 1-olefins with formaldehyde and a halogenating agent selected from hydrogen halides, thionyl halides, and carbonyl halides. When the reaction is conducted at a temperature of −40° C. or lower and at a pressure of at least 100 pounds per square inch, novel 1-methylalkoxy-3-haloalkoxymethanes are formed in addition to the cyclic or acyclic ether. 4-chloro-3-heptyltetrahydro-

pyran, a cyclic ether produced by the process of this invention, can be used as a plasticizer in poly(vinyl chloride).

3,564,022

COLOR STABILIZED MALEIC ANHYDRIDE AND PROCESSES THEREFOR

Gus P. Manoff, St. Louis, Mo., and Albert R. Hall, Caseyville, Ill., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Filed Mar. 18, 1968, Ser. No. 714,025
Int. Cl. C07c *57/14*
U.S. Cl. 260—346.8 12 Claims

A process for stabilizing maleic anhydride by heating crude maleic anhydride in the presence of a heat stable acidic compound, followed by distillation and the subsequent addition of a hydrocarbon sulfide.

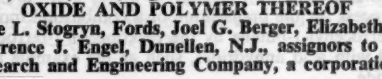
3,564,023

1,4-BIS-(TRIS(NF_2)METHOXY)-2-BUTENE OXIDE AND POLYMER THEREOF

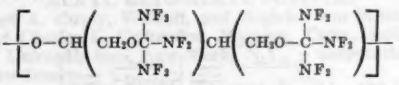
Eugene L. Stogryn, Fords, Joel G. Berger, Elizabeth, and Lawrence J. Engel, Dunellen, N.J., assignors to Esso Research and Engineering Company, a corporation of Delaware

No Drawing. Filed July 29, 1964, Ser. No. 386,088
Int. Cl. C07c *93/10;* C07d *1/18*
U.S. Cl. 260—348 10 Claims

1. The compound 1,4-bis-[tris(NF_2)methoxy]-2-butene oxide having the formula:



4. The liquid polymers of polymeric 1,4-bis-[tris(NF_2) methoxy]-2-butene oxide having the recurring monomeric unit composition:



3,564,024

2-METHOXY-5-METHYL-6-MULTIPRENYL-1,4-BENZOQUINONES

Karl Folkers and Glenn Doyle Daves, Jr., Menlo Park, Calif., assignors, by mesne assignments, to Merck & Co., Inc., Rahway, N.J., a corporation of New Jersey

No Drawing. Filed June 28, 1966, Ser. No. 561,017
Int. Cl. C07c *49/64*
U.S. Cl. 260—396 6 Claims

2-methoxy-5 - methyl - 6 - multiprenyl - 1,4 - benzoquinones are prepared by the acid-catalyzed condensation of 2-methoxy-5-methylbenzoquinone with an isoprenoid alcohol. The products are useful as intermediates in the microbiological synthesis of coenzyme Q compounds.

3,564,025

2 - METHOXY - 6 - MULTIPRENYL - 1,4 - BENZOQUINONES AND A PROCESS OF MAKING

Karl Folkers and Glenn Doyle Daves, Jr., Menlo Park, Calif., assignors to Merck & Co., Inc., Rahway, N.J., a corporation of New Jersey

No Drawing. Filed June 28, 1966, Ser. No. 561,024
Int. Cl. C07c *49/64*
U.S. Cl. 260—396 7 Claims

2-methoxy-6-multiprenyl-1,4-benzoquinones are prepared by reacting a 2-methoxy-6-multiprenylphenol with potassium nitrodisulfonate. The products are useful as intermediates in the microbiological synthesis of coenzyme Q compounds.

3,564,026

N-(4-NITROPHENYLSULFONYL)-N'-(CHLORO SUBSTITUTED ACETYL) UREAS

Lowell R. Smith, Chesterfield, and Angelo John Speziale, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Original application June 17, 1968, Ser. No. 737,325. Divided and this application June 12, 1969, Ser. No. 844,237
Int. Cl. A01n *9/16;* C07c *143/78*
U.S. Cl. 260—397.7 4 Claims

Compounds of the class N-(4-nitrophenylsulfonyl)-N'-(chloro substituted acetyl) ureas which compounds are phytocidally active.

3,564,027

NOVEL 1-METHYL-OESTRENE COMPOUNDS

Carel Christoff Bolt, Oss, Netherlands, assignor to Organon Inc., West Orange, N.J., a corporation of New Jersey

No Drawing. Filed Oct. 12, 1967, Ser. No. 674,731
Claims priority, application Netherlands, Oct. 22, 1966, 6615005
Int. Cl C07c *169/08*
U.S. Cl. 260—397.5 1 Claim

The present invention relates to novel Δ^4-1α-methyl-17β-hydroxy-17α-saturated or unsaturated alkyl-oestrene compounds.

These compounds exert strong anabolic, androgenic, oestrogenic, progestational and ovulation inhibiting activities.

3,564,028

PROCESS FOR THE PREPARATION OF MINERAL OXY-ACID ESTERS OF 9α-FLUORO-16-METHYL-PREDNISOLONE

Joao Villax, Travessa do Ferreiro, a Lapa 1, Lisbon 3, Portugal

No Drawing. Continuation of application Ser. No. 761,020, Aug. 6, 1968, which is a continuation-in-part of application Ser. No. 630,787, Apr. 11, 1967, which in turn is a continuation-in-part of application Ser. No. 178,545, Mar. 9, 1962. This application Oct. 6, 1969, Ser. No. 871,736
Int. Cl. C07c *169/32*
U.S. Cl. 260—397.45 1 Claim

Mineral oxy-acid esters of corticosteroids are prepared by reacting a lower alkyl chlorocarbonate with either sulfuric acid, or orthophosphoric acid, or their alkali or alkaline earth metal salts, in presence of a tertiary amine, and then reacting the resulting lower alkyl carbonic acid ester with the corticosteroid, such as prednisolone or its fluoro derivatives. New steroids produced by this reaction include the 21-sulfuric acid ester, and 21-phosphoric acid ester of 9α-fluoro-16β-methyl-prednisolone and their sodium salts, which are useful for the remission of pain, bleeding tendency, and fever, in a variety of pathological conditions, being also powerful anti-inflammatory agents. The 21-sulfuric acid ester of 9α-fluoro-16β-methyl-prednisolone exhibits a prolonged anti-inflammatory action, more than twice the duration of the corresponding 21-phosphate, and is especially useful for formulating long-acting corticosteroid preparations.

3,564,029

HYDROXYMETHYLATED, FLUOROACYLATED AMINOHYDROXY AROMATIC COMPOUNDS

Domenick Donald Gagliardi, East Greenwich, R.I., assignor to Colgate-Palmolive Company, New York, N.Y., a corporation of Delaware

No Drawing. Filed Nov. 7, 1967, Ser. No. 681,084
Int. Cl. C09f *7/00*
U.S. Cl. 260—404 8 Claims

Perfluoroacylaminohydroxy aromatic compounds are provided which are outstanding for producing oil and water repellent effects on textiles as well as increasing the resistance to soiling by oily particulate soil. The aromatic

nucleus which may contain 1, 2 or 3 rings may contain 1 or 2 amino groups, 1 or 2 hydroxy groups and up to 2 hydroxy methyl groups. One or 2 of the amino groups are acylated with a perfluoro acyl group containing from 3 to 21 carbon atoms in which at least 70% of the hydrogens have been replaced with fluorine. The compounds may also contain alkyl substituents of from 1 to 5 carbon atoms.

3,564,030

PROCESS FOR MONO-ALKYLATION OF AROMATIC COMPOUNDS

Eugene J. Miller, Jr., Wheaton, Ill., Ago Mais, Trenton, N.J., and Edgar S. Hammerberg, Chicago, Ill., assignors, by mesne assignments, to Armour Industrial Chemical Company, a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 451,021, Apr. 26, 1965. This application Oct. 30, 1967, Ser. No. 679,251

Int. Cl. C11c *1/00*

U.S. Cl. 260—413 **12 Claims**

A process for mono-alkylation of aromatic compounds with unsaturated higher aliphatic compounds such as acids, amines, nitriles, esters, amides, and alcohols, in the presence of hydrofluoric acid to produce a high yield of products having mono-alkylation of the aromatic nucleus. The mono-alkylated products of this invention are useful as plasticizers, emulsifiers, and chemical intermediates.

3,564,031

PROCESS FOR CONTINUOUS PRODUCTION OF MONO-ALKYLATED AROMATIC COMPOUNDS

Ralph H. Potts, La Grange, and Norman D. Gordon and Sydney H. Shapiro, Chicago, Ill., assignors to Armour Industrial Chemical Company, Chicago, Ill., a corporation of Delaware

No Drawing. Filed May 6, 1968, Ser. No. 727,058

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 **6 Claims**

A continuous process for mono-alkylation of aromatic compounds with unsaturated higher aliphatic compounds such as acids, amines, nitriles, esters, amides and alcohols in a hydrogen fluoride media to produce a high yield of mono-alkylated aromatic products. The mono-alkylated aromatic compounds of this invention are useful as plasticizers, emulsifiers and chemical intermediates.

3,564,032

PROCESS FOR THE OXIDATIVE BLEACHING OF CRUDE MONTAN WAX

Friedrich Zinnert and Hans-Georg Kolm, Gersthofen, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 29, 1968, Ser. No. 748,229

Claims priority, application Germany, Aug. 12, 1967, F 53,214

Int. Cl. C11b *3/08*

U.S. Cl. 260—423 **6 Claims**

Crude montan wax, partially deresinified crude montan wax and saponification products of the said waxes are oxidatively bleached in powdered form at a temperature in the range of from 10 to 90° C. with gases containing oxygen and catalytic amounts of dinitrogen trioxide or nitrogen dioxide.

3,564,033

TRICYCLOHEXYLTIN HALIDE PROCESS

Gerald H. Reifenberg, Hightstown, and William J. Considine, Somerset, N.J., assignors to M & T Chemicals Inc., New York, N.Y., a corporation of Delaware

No Drawing. Filed Nov. 4, 1968, Ser. No. 773,331

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 **3 Claims**

The process of this invention for preparing tricyclohexyltin halide $(C_6H_{11})_3SnX$ wherein X is selected from the group consisting of chloride and bromide, comprises a first step of forming phenyltin trihalide by reacting as reactants tetraphenyltin and tin tetrahalide thereby forming phenyl trihalide, a second step of preparing tricyclohexylphenyltin by reacting as reactants said phenyltin trihalide prepared in said first step with cyclohexyl magnesium halide in an amount of at least three moles of cyclohexyl magnesium halide per mole of phenyltin trihalide to form said tricyclohexylphenyltin and a third step of reacting as reactants said tricyclohexylphenyltin prepared in said second step and tin tetrahalide to produce said tricyclohexyltin halide.

3,564,034

PROCESS FOR THE PREPARATION OF 1,3-DIFERROCENYL-1-BUTENE

Charles S. Combs, Jr., and William D. Stephens, Huntsville, Ala., assignors to Thiokol Chemical Corporation, Bristol, Pa., a corporation of Delaware

No Drawing. Filed Aug. 16, 1968, Ser. No. 753,078

Int. Cl. C07f *15/02;* **C10d** *9/10*

U.S. Cl. 260—439 **6 Claims**

A process for the preparation of a combustion modifier 1,3-diferrocenyl-1-butene by the reaction of 1-ferrocenylethanol with acid anhydrides, such as for example acetic anhydride.

3,564,035

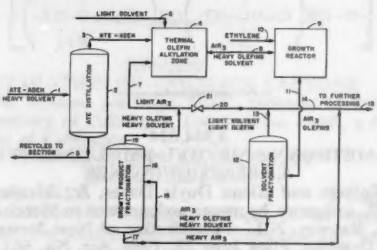
CONTROL OF POISSON DISTRIBUTION IN ALUMINUM ALKYL GROWTH PRODUCT

Clyde Q. Sheely, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla., a corporation of Delaware

Filed Aug. 8, 1968, Ser. No. 751,203

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 **5 Claims**



In the preparation of aluminum alkyls by growth of low molecular weight aluminum trialkyls or aluminum dialkyl hydrides, the Poisson distribution is modified by a particular sequence of processing steps. Heavier by-product olefins formed in the growth reactor are separated with the lighter aluminum alkyls and are subjected to alkylation and growth to add onto the lower molecular weight aluminum alkyls.

3,564,036

PREPARATION OF DI-LITHIO (PERFLUOROALKYLETHYLSILYL) NEOCARBORANES

Cecil L. Frye, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich., a corporation of Michigan

No Drawing. Filed May 1, 1969, Ser. No. 821,146

Int. Cl. C07d *107/02;* **C07f** *5/02, 7/08*

U.S. Cl. 260—448.2 **4 Claims**

This invention relates to a process for the preparation of di-lithio (perfluoroalkylethylsilyl)neocarboranes by reacting dilithioneocarborane with a cyclic trisiloxane.

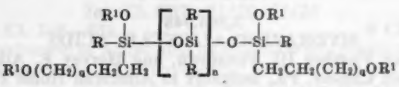
3,564,037

NOVEL POLYSILOXANE-POLYALKYLENE COPOLYMERS

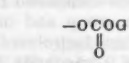
Jean Claude Auguste Delaval and Paul Alfred Eugene Guinet, Lyon, Jean Marius Ernest Morel, Rhone, and Robert Raphael Puthet, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France, a French body corporate

No Drawing. Filed Dec. 18, 1967, Ser. No. 691,210
Claims priority, application France, Dec. 29, 1966, 89,368
Int. Cl. C07f 7/18
U.S. Cl. 260—448.8 12 Claims

The invention relates to copolymers of general formula



wherein R is an alkyl, cycloalkyl, phenyl, alkylphenyl or phenylalkyl group, n is between 2 and 700, q is 0 to 3, and R^1O— is a group of general formula $A(C_xH_{2x}O)_y$, wherein x is 2 to 4, y is at least one, and A is hydroxy, formyloxy, —OG, —OCOG,



—NHG, —OCONHG or —NHCOG, wherein G is a hydrocarbon radical. The copolymers are useful as surface active agents in the preparation of polyurethane foams.

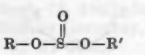
3,564,038

ALKYL KETO-ALKYL SULFITES

Rupert A. Covey, Wolcott, and Bogislav von Schmeling and Charles E. Crittendon, Hamden, Conn., assignors to Uniroyal, Inc., New York, N.Y., a corporation of New Jersey

No Drawing. Filed Dec. 22, 1967, Ser. No. 692,714
Int. Cl. A01n 9/14; C07c 137/00
U.S. Cl. 260—456 5 Claims

Novel sulfite esters having the formula



wherein R is on alkyl or a mono-haloalkyl radical having up to 10 carbon atoms and R′ is a ketoalkyl group having 3 to 5 carbon atoms or a mono-halosubstituted derivative thereof, useful as herbicides, insecticides, and nematocides.

3,564,039

DIIMINOSUCCINONITRILE AND ITS PREPARATION FROM CYANOGEN AND HYDROGEN CYANIDE

Owen Wright Webster, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 670,763, Sept. 26, 1967. This application Feb. 23, 1968, Ser. No. 707,459
Int. Cl. C06b 1/00; C07c 121/42
U.S. Cl. 260—465.5 11 Claims

Described and claimed are the novel compound diiminosuccinonitrile and its preparation from cyanogen and hydrogen cyanide at a temperature of −80° C. to 10° C., and in the presence of a basic catalyst. The compound is useful as an intermediate in the preparation of diaminomaleonitrile and as a solid propellant.

3,564,040

REMOVAL OF TRANS-2-PENTENENITRILE FROM 3- AND 4-PENTENENITRILE

Roland Granville Downing, Chatham, Del., and Roger Allen Fouty, Vienna, W. Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Filed June 14, 1968, Ser. No. 737,069
Int. Cl. C07c 121/26
U.S. Cl. 260—465.8 9 Claims

Removal of trans-2-pentenenitrile from a mixture of cis- and trans-3-pentenenitrile and 4-pentenenitrile by the catalytic isomerization of the trans-2-pentenenitrile to cis-2-pentenenitrile followed by fractional distillation of the solution of isomers to remove the cis-2-pentenenitrile. The catalysts used have the structure $Ni[M(Z)_3]_4$ where M is P, As or Sb and Z is R or OR wherein R is an alkyl group or an aryl group of up to 18 carbon atoms.

3,564,041

1,2,3-TRIHYDROCARBYLGUANIDINE-1-CARBOXYLATES

William J. Farrissey, North Branford, Conn., and Raymond J. Ricciardi, Snyder, N.Y., assignors to The Upjohn Company, Kalamazoo, Mich., a corporation of Delaware

No Drawing. Filed Apr. 26, 1967, Ser. No. 633,685
Int. Cl. C07c 133/10
U.S. Cl. 260—471 6 Claims

A novel process for the preparation of 1,2,3-trihydrocarbyl guanidine-1-carboxylic acid esters and amides by reaction of the corresponding 1,3-dihydrocarbyl-4-hydrocarbylimino-uretidine-2-one with an amine or hydroxyl group containing compound in the presence of a catalyst. Catalysts are saturated aliphatic acids and alkali metal salts thereof, alkali metal phenoxides and alkali metal alkoxides, The guanidine derivatives so obtained are novel compounds useful as stabilizing agents for polyolefins, and as intermediates for polyurethanes.

3,564,042

DERIVATIVES OF ACETIC ACID

Rudolf G. Griot, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J., a corporation of Delaware

No Drawing. Filed Mar. 17, 1967, Ser. No. 623,798
Int. Cl. C07c 65/00, 69/76
U.S. Cl. 260—473 2 Claims

The compounds are of the class of α,α-bis(p-chlorophenoxy)-α-substituted acetic acids and esters thereof which are useful as hypocholesteremic/hypolipemic agents.

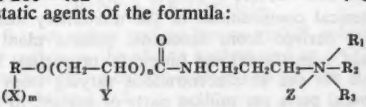
3,564,043

HALOGENATED CARBAMATE ANTISTATIC AGENTS

Fred S. Eiseman, Jr., Maplewood, and Leslie M. Schenck, Mountainside, N.J., assignors to GAF Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed June 17, 1968, Ser. No. 737,312
Int. Cl. C07c 125/06
U.S. Cl. 260—482 7 Claims

Antistatic agents of the formula:



wherein R represents alkyl, aryl or alkaryl radicals containing from 2 to about 18 carbon atoms, X represents halogen substituents such as chloro, bromo, fluoro, m represents an integer of from 1 to 37, Y represents hydrogen, methyl or ethyl, n represents an average value

of from 1 to 10, R_1 and R_2 are members of the group consisting of alkyl and hydroxyalkyl radicals having from 1 to 3 carbon atoms and R_3 is a hydroxyalkyl radical of from 1 to 4 carbon atoms and Z is an anion, said antistatic agent being prepared by the condensation of halogen substituted alkyl, aryl and alkaryl polyethyleneoxy chlorocarbonate with a substituted alkyl diamine with subsequent acidification and alkoxylation so as to produce the desired antistatic agent.

3,564,044

LIQUID ESTERS OF NEOALKYLPOLYOLS AND MIXTURES OF GEM AND STRAIGHT CHAIN OR ALKANOIC NEO ACIDS

Tai S. Chao, Homewood, and William D. Hoffman, Park Forest, Ill., and Manley Kjonaas, Hammond, Ind., assignors to Sinclair Research, Inc., New York, N.Y., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 557,898, June 16, 1966. This application Oct. 5, 1967, Ser. No. 673,020

Int. Cl. C07c *69/32*

U.S. Cl. 260—488 **10 Claims**

Neoalkylpolyol esters of mixtures of gem acids and straight or branched chain neo fatty acids are prepared. These esters possess improved oxidation resistance and good low temperature properties and are suitable for use as base fluids or blending stock for high temperature lubricants.

3,564,045

METHOD FOR MAKING PROPYLENE GLYCOL EMULSIFIER

Ben W. Minshew, Decatur, Ill., assignor, by mesne assignments, to Continental Illinois National Bank and Trust Company of Chicago, Chicago, Ill.

No Drawing. Continuation of application Ser. No. 404,936, Oct. 19, 1964. This application Nov. 14, 1968, Ser. No. 775,903

Int. Cl. A23d *5/00;* **C11c** *3/04*

U.S. Cl. 260—410.6 **7 Claims**

A process for preparing propylene glycol mixed esters. An ester interchange reaction is promoted between propylene glycol and triglycerides in the presence of an alkali methyl alcoholate catalyst by heating at a temperature range of slightly above the melting point of the triglycerides to about 250° F. and then recovering the propylene glycol mixed esters.

3,564,046

QUATERNARY AMMONIUM DERIVATIVES OF LIMONENE

William F. Newhall, Winter Haven, Fla., assignor to Amchem Products, Inc., Ambler, Pa., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 604,622, Dec. 27, 1968. This application May 16, 1969, Ser. No. 825,437

Int. Cl. C07c *87/46*

U.S. Cl. 260—501.15 **10 Claims**

Chemical compositions of the quaternary ammonium type as derived from limonene, possess plant growth regulant, nematocidal and fungicidal properties. They are suitable for use at concentrations varying from as little as several parts per million parts of carrier, to as much as several thousand parts per million parts of carrier. Compositions useful in the present invention are exemplified by benzyl dimethyl (1-hydroxy-p-menth-8-en-2-yl) ammonium chloride, but many other compounds of somewhat different character are contemplated.

3,564,047

CRYSTALLINE ANHYDROUS AMINO TRI(METHYLENEPHOSPHONIC ACID)

Riyad R. Irani, St. Louis, Mo. (9106 Ambleside Drive, Mentor, Ohio 44060), and Kurt Moedritzer, 408 Belleview Ave., Webster Groves, Mo. 63119

No Drawing. Continuation-in-part of application Ser. No. 152,048, Nov. 13, 1961. This application Dec. 23, 1964, Ser. No. 420,795

Int. Cl. C02b *5/06;* **C07f** *9/38;* **C11d** *3/36*

U.S. Cl. 210—502.5 **1 Claim**

Crystalline anhydrous amino tri(methylenephosphonic acid) useful as a sequestering agent, a deflocculating agent and a detergent builder.

3,564,048

HYDRAZINO ALICYCLIC ACIDS

Horace Fletcher III, Pottstown, and Harvey E. Alburn, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed June 25, 1968, Ser. No. 739,611

Int. Cl. C07c *109/00*

U.S. Cl. 260—514 **3 Claims**

Alicyclic acids having a hydrazine substituent are prepared by reacting acetyl hydrazine with an alicyclic compound, the cycloalkylidene compound formed being then reacted to add a cyano group and the cyano alicyclic hydrazide formed is then hydrolyzed to produce the desired compound. The compounds have biochemical activity.

3,564,049

ADAMANTANE-(1)-CARBOXYLIC ACID DERIVATIVES

Wagn Ole Godtfredsen, Vaerlose, Denmark, assignor to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark, a firm

No Drawing. Original application Sept. 27, 1965, Ser. No. 490,630. Divided and this application Apr. 29, 1969, Ser. No. 820,278

Claims priority, application Great Britain, Sept. 28, 1964, 39,459/64; Feb. 1, 1965, 4,325/65

Int. Cl. C07c *101/14*

U.S. Cl. 260—514 **5 Claims**

This invention relates to functionally reactive derivatives of adamantane-(1)-carboxylic acid having the formula

II

in which each of R_1 and R_2 is a hydrogen atom or a lower alkyl radical containing from 1–4 carbon atoms, and COY stands for a radical capable of reacting with the amino group of 6-aminopenicillanic acid to result in the formation of 3-substituted adamantyl-(1) penicillins.

3,564,050

HYDROXY BENZOIC ACID DERIVATIVES

Charles Hoffmann, Enghien-les-Bains, France, assignor to AG. für Chemische und Medizinische Forschung, Lucerne, Switzerland, a corporation of Switzerland

No Drawing. Filed Mar. 3, 1967, Ser. No. 620,222

Claims priority, application Great Britain, Apr. 1, 1966, 14,577/66

Int. Cl. C07c *65/04*

U.S. Cl. 260—521 **2 Claims**

Certain derivatives of 4-hydroxy benzoic acid are disclosed having a choleretic action. The most significant

compound is 3-(-hydroxypentyl)-4-hydroxy benzoic acid and those related compounds in which the carboxylic acid group can be —COOH— or an alkyl, alkali metal or alkaline earth metal derivative thereof.

3,564,051

PRODUCTION OF ADIPIC ACID

Erich Haarer and Gotthilf Wenner, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 19, 1967, Ser. No. 654,642
Claims priority, application Germany, July 22, 1966, P 15 68 146.6
Int. Cl. C07c *51/20, 51/28*
U.S. Cl. 260—531 **9 Claims**

Production of adipic acid by oxidation of cyclohexanol, cyclohexanone, ω-hydroxycaproic acid or mixtures containing such compounds with nitric acid in the presence of vanadium and optionally copper catalysts wherein the excess nitric acid is distilled off, the residue is fractionated under subatmospheric pressure without previous separation of the catalyst and the catalyst-containing bottoms product is fed into the next charge.

3,564,052

PREPARATION OF CALCIUM PANTOTHENATE AND ITS DOUBLE SALTS

Myer Freed, Chicago, Ill., assignor to Daw's Laboratories, Inc., Chicago, Ill., a corporation of Illinois

No Drawing. Filed Nov. 13, 1962, Ser. No. 237,339
Int. Cl. C07c *99/04, 101/30*
U.S. Cl. 260—534 **4 Claims**

This invention relates to the preparation of calcium pantothenate and to the double salts of pantothenate as represented by the compound calcium pantothenate chloride.

3,564,053

PRODUCTION OF β-CHLOROALKYL OF β - BROMOALKYL SULFOCHLORIDES OR SULFOBROMIDES

Harry Distler, Ludwigshafen (Rhine), Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 12, 1967, Ser. No. 667,096
Claims priority, application Germany, Sept. 20, 1966, P 12 51 748.5
Int. Cl. C07c *143/70*
U.S. Cl. 260—543 **6 Claims**

Production of β-chloroethyl, β-bromoethyl, β-chloropropyl or β-bromopropyl sulfochlorides or sulfobromides by the reaction of β-hydroxyethylmercaptan or β-hydroxypropylmercaptan at temperatures of −15° C. to +50° C. ratio of 1:3 to 1:6 in the presence of 1 to 1.1 moles of water per mole of β-hydroxyethylmercaptan or β-hydroxypropylmercaptan at temperatures of −15° C. to +50° C. It is possible to use inert solvents in the reaction. The products are suitable for the production of polyvinylsulfonic acid which can be used as catalyst in hydrolytic reactions.

3,564,054

ALIPHATIC COMPOUNDS CONTAINING DIFLUORAMINO GROUPS

Charles M. Orlando, Union, N.J., assignor to Esso Research and Engineering Company, a corporation of Delaware

No Drawing. Filed June 2, 1964, Ser. No. 372,126
Int. Cl. C07c *83/02, 83/06, 83/08*
U.S. Cl. 260—563 **11 Claims**

1. Process for the synthesis of an energetic organic compound having $2NF_2$ groups attached to a single carbon atom with an oxygen-containing function attached to a vicinal carbon atom which comprises reacting HNF_2 with a trifluoroacetoxy ketone having the trifluoroacetoxy group attached to a carbon atom vicinal to the carbon atom in the carbonyl group of the ketone to replace the oxygen of the carbonyl group by $2NF_2$ groups and recovering a resulting reaction product which has the trifluoroacetoxy group attached to a carbon atom vicinal to the carbon atom having a gem NF_2 structure,

$$—(NF_2)C(NF_2)—$$

7. An aliphatic compound having two difluoramino groups attached to a carbon atom that is linked to a vicinal carbon atom attached to oxygen in a function selected from the group consisting of ester, hydroxyl, and ketonic carbonyl, said compound having a formula selected from the group consisting of

$$R{\cdot}C(NF_2)_2{\cdot}CH(\cdot O\overset{O}{\overset{\|}{C}}—CF_3){\cdot}R'$$

$$R{\cdot}C(NF_2)_2{\cdot}CH(OH){\cdot}R'$$

$$R{\cdot}C(NF_2)_2\overset{O}{\overset{\|}{C}}{\cdot}R'$$

wherein R and R′ represent hydrocarbon moieties selected from alkyl groups and methylene groups bonded in a cyclic structure, said hydrocarbon moieties having a total of 2 to 4 carbon atoms.

3,564,055

ETHERS CONTAINING DIFLUORAMINO GROUPS

Abraham Zimmerman, New York, N.Y., assignor to Esso Research and Engineering Company, a corporation of Delaware

No Drawing. Filed Oct. 16, 1963, Ser. No. 317,108
Int. Cl. C07c *93/02*
U.S. Cl. 260—584 **2 Claims**

1. The compound tris[tris(NF_2)methoxymethyl]-nitromethane having the composition:

$$O_2NC[CH_2OC(NF_2)_3]_3$$

2. The method of making tris[tris(NF_2)methoxymethyl]-nitromethane which comprises reacting tris(hydroxymethyl)-nitromethane with perfluoroguanidine in acetonitrile with urea as catalyst, fluorinating the resulting crude product with fluorine, and recovering a solid crystalline product having the composition:

$$O_2NC[CH_2OC(NF_2)_3]_3$$

3,564,056

ETHERS CONTAINING DIFLUORAMINO GROUPS

Lawrence J. Engel, Dunellen, and Michael H. Gianni, Roselle, N.J., and Abraham A. Zimmerman, New York, N.Y., assignors to Esso Research and Engineering Company, a corporation of Delaware

No Drawing. Filed June 5, 1964, Ser. No. 373,143
Int. Cl. C07c *93/02*
U.S. Cl. 260—584 **7 Claims**

1. A compound having the formula:

$$R(NF_2)_n[OC(NF_2)_3]_m$$

wherein R is an alakne nucleus having an NF_2 substituent linked to carbon in the alkane nucleus and an $OC(NF_2)_3$ substituent linked to a carbon atom in said nucleus, *n* being 1 to 4 and *m* being 1 to 2.

7. The method of producing a compound having a substituted alkane nucleus with —NF_2 and —$OC(NF_2)_3$ groups linked to carbon in said nucleus, which comprises reacting an NF_2-substituted alcohol of the group consisting of lower difluoroaminoalaknols and lower difluoroaminoalkanediols with perfluoroguanidine to replace the

OH groups by —$OC(NF_2)NFH$ functions, then reacting the resulting product with fluorine under low temperature conditions to replace the —$OC(NF_2)NFH$ functions by —$OC(NF_2)_3$ functions with the NF_2 groups remaining attached to carbon in the alkane nucleus.

3,564,057

PRODUCTION OF ALKANOLAMINES

John B. Tindall, Terre Haute, Ind., assignor to Commercial Solvents Corporation, New York County, N.Y., a corporation of Maryland

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,653
Int. Cl. C07c *85/10*
U.S. Cl. 260—584 7 Claims

An improved process for the production of primary alkanolamines by the reduction of nitroalkanols whereby the content of N-alkylated alkanolamines is substantially reduced, by effecting the reduction step in the presence of ammonia or a soluble primary or secondary aliphatic amine.

3,564,058

PROCESS FOR THE MANUFACTURE OF CYCLOHEXANOL AND CYCLOHEXANONE

Roland Lang, Anspach, Taunus, and Horst Corsepius, Frankfurt am Main, Germany, assignors to Vickers-Zimmer Aktiengesellschaft Planung ung Bau van Industrieanlagen, Frankfurt am Main, Germany

Filed Dec. 7, 1967, Ser. No. 688,774
Claims priority, application Germany, Dec. 7, 1966, V 32,498
Int. Cl. C07c *35/08, 45/08, 49/30*
U.S. Cl. 260—586 5 Claims

This invention relates to the process for the manufacture of cyclohexanol and cyclohexanone by the oxidation of cyclohexane which comprises contacting an oxygen-containing gas with cyclohexane in a first reaction vessel to obtain oxygen-saturated cyclohexane and transferring the oxygen-saturated cyclohexane to a second reaction vessel maintained at a higher temperature for the oxidation reaction.

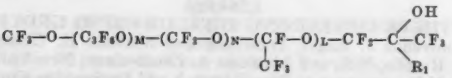
3,564,059

PERFLUORINATED ETHERS AND POLYETHERS

Dario Sianesi, Milan, Renzo Fontanelli, Rome, and Gerardo Caporiccio, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed July 24, 1967, Ser. No. 655,665
Claims priority, application Italy, July 26, 1966, 17,332/66; Dec. 16, 1966, 792,673/66
Int. Cl. C07c *43/12, 49/04, 91/40*
U.S. Cl. 260—594 4 Claims

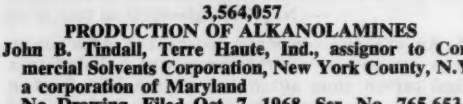
Fluorinated compounds and mixtures thereof of the general formula



wherein M, N and L may be the same or different numbers and are zero or a whole number from 1 to 100, the sum of $M+N+L$ is zero or a number between 1 and 100, the ratio of

$$\frac{N+L}{M+1}$$

is a number between zero and 2, C_3F_6 represents the unit derived from the opening of the double bond of a molecule of hexafluoropropylene, the different perfluoroalkylene units having a random distribution along the polymer chain, and R_1 is selected from the group consisting of —OH, —OR_2, —CN, and —NR_3R_4, wherein R_2 is a radical containing from 1 to 12 carbon atoms, and is alkyl, alkylaryl, aryl, cycloalkyl or is the corresponding halogen-substituted radical, and R_3 and R_4 may be hydrogen or the same or different radicals containing from 1 to 12 carbon atoms and are selected from the group consisting of alkyl, alkylaryl, aryl, halogen-substituted aryl, cycloalkyl, and the derivatives thereof having one or more molecules of water of hydration are prepared by reacting corresponding perfluorinated ketones and mixtures thereof of the general formula



with a reactant selected from the group consisting of water, primary, secondary or tertiary alcohols, HCN, NaCN ammonia, primary and secondary aliphatic amines, aniline, diphenylamine, anilines halo- and alkyl-substituted in the nucleus and diphenylamines halo- and alkyl-substituted in the nucleus, at a temperature of from about −40° to +150° C. and under a pressure of from about 0.1 to 50 atmospheres. These products are useful as plasticizers and solvents for halogenated polymers.

3,564,060

PHARMACEUTICALLY ACTIVE DERIVATIVES OF 4 - PHENYL - BICYCLO[2.2.2]OCTANE AND OCT-2-ENE-1-CARBINOLS AND CARBOXALDEHYDES

Paul E. Aldrich, Wilmington, and Edward C. Hermann, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

No Drawing. Filed Dec. 8, 1967, Ser. No. 688,989
Int. Cl. C07c *39/02, 43/20*
U.S. Cl. 260—613 3 Claims

This disclosure teaches that a new class of compounds the 4-phenylbicyclo[2.2.2]octane and oct-2-ene - 1 - carbinols and carboxaldehydes are pharmaceutically useful as antifertility agents.

Compounds within the scope of this invention can be formulated into injectible, oral or rectal dosage forms and when administered by the appropriate route are surprisingly effective to prevent pregnancy in animals.

3,564,061

STABILIZATION OF HALOGENATED SOLVENTS

Yves Correia, Peyruis, and Georges Clerc, Saint Auban, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

No Drawing. Filed Aug. 15, 1966, Ser. No. 572,187
Claims priority, application France, Aug. 17, 1965, 28,550
Int. Cl. C07c *17/40, 17/42*
U.S. Cl. 260—652.5 5 Claims

Chlorinated or brominated alkenes containing 2–4 carbon atoms stabilized with trimethyl orthoformate and a compound selected from the group consisting of C_1–C_4 alkanols, C_1–C_4 alkyl cyanides, 1,4-dioxane, trioxane and C_1–C_4 nitroalkanes.

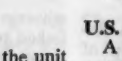
3,564,062

PRODUCTION OF NITROALKANOLS

John B. Tindall, Terre Haute, Ind., assignor to Commercial Solvents Corporation, New York, N.Y., a corporation of Maryland

No Drawing. Filed Mar. 15, 1968, Ser. No. 713,289
Int. Cl. C07c *79/18, 89/00*
U.S. Cl. 260—635 7 Claims

A process for the production of nitroalkanols corresponding to the formula



where R is methyl, ethyl or hydroxymethyl, by adding a mixture of a primary nitroalkane and formaldehyde, to a suspension of a calcium or barium base, adding the re-

sulting mixture to an aqueous solution containing an excess of carbon dioxide, separating the precipitated calcium or barium carbonate thereby producing the nitroalkanol.

3,564,063
STABILIZED METHYLCHLOROFORM COMPOSITIONS

Charles L. Cormany, Wadsworth, William R. Dial, Akron, and Blaine O. Pray, Wadsworth, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa., a corporation of Pennsylvania

No Drawing. Original application Feb. 3, 1958, Ser. No. 712,693. Divided and this application May 7, 1969, Ser. No. 82,707

The portion of the term of the patent subsequent to June 2, 1987, has been disclaimed

Int. Cl. C07c *17/40, 17/42*

U.S. Cl. 260—652.5 **1 Claim**

Stabilized methylchloroform compositions are provided by the incorporation therein a minor concentration of one or more various additives. Nitriles such as acetonitrile are noted.

3,564,064
PROCESS FOR MANUFACTURING TRIFLUOROETHYLENE

Shinichi Nakagawa, Settsu-shi, Japan, assignor to Daikin Kogyo Kabushiki Kaisha, Asaka-shi, Japan

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,797

Claims priority, application Japan, Dec. 16, 1966, 41/82,564

Int. Cl. C07c *17/00, 21/18*

U.S. Cl. 260—653.5 **5 Claims**

A process for manufacturing trifluoroethylene from trifluorochloroethylene, which comprises introducing a gas-phase mixture of hydrogen and trifluorochloroethylene in a mole ratio of H_2 to $CClF{=}CF_2$ between 0.8:1 and 1.2:1 into a reaction zone to bring the mixture into contact with a palladium or platinum catalyst maintained at 200 to 320° C. for 0.1 to 4.0 seconds, and recovering $CHF{=}CF_2$ from the resulting reaction products.

3,564,065
FLUID BED CATALYTIC METHOD FOR PRODUCING TRICHLOROPROPANES

Albert Antonini and Emile Trebillon, Paris, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

No Drawing. Filed July 17, 1967, Ser. No. 653,606

Claims priority, application France, July 21, 1966, 70,264

Int. Cl. C07c *17/06*

U.S. Cl. 260—659 **2 Claims**

The process for producing trichloropropanes by reacting propene, hydrochloric acid and oxygen in a molar ratio of propene/oxygen/hydrochloride of 1/0.65 to 1.5/2.0 to 6.5 in which the reaction is carried out at a temperature within the range of 200° to 350° C. in the presence of a fluid catalyst containing a copper compound as the principal active agent on a catalyst support having a specific surface of 0.5 to 300 m.²/g.

3,564,066
FIXED BED CATALYTIC PROCESS FOR THE PREPARATION OF TRICHLOROPROPANES

Emile Trebillon, Paris, and Georges Wetroff, Val d'Oise, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

No Drawing. Filed July 17, 1967, Ser. No. 653,655

Claims priority, application France, July 21, 1966, 70,265

Int. Cl. C07c *17/06*

U.S. Cl. 260—659 **5 Claims**

A process for the production of trichloropropanes by reaction of propene, hydrogen chloride and oxygen in a molar ratio of propene/O_2/HCl of 1/0.65 to 1.40/2.0 to 6.5 at a temperature within the the range of 170° to 370° C. in the presence of a fixed bad catalytic mass having a compound of copper as the principal active agent deposited on a catalyst support having a specific surface within the range of 1 to 300 m.²/g. and in which the maximum temperature reached in the interior of the catalytic mass is 30° to 200° above the wall temperature of the reactor and in which the materials are reacted at a flow rate of 1 to 100 moles of propene per liter of catalytic per hour.

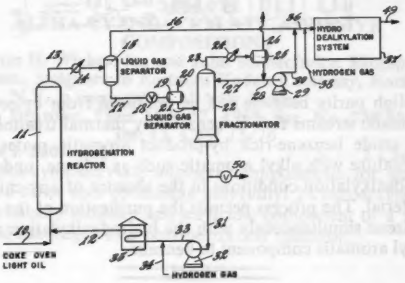
3,564,067
PROCESS FOR TREATMENT OF COKE OVEN LIGHT OIL

Walter Brenner, Wayne, and Louis C. Doelp, Jr., Glen Mills, Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa., a corporation of Delaware

Filed May 6, 1968, Ser. No. 726,883

Int. Cl. C10g *9/16, 7/00;* **C07c** *3/58*

U.S. Cl. 260—672 **10 Claims**



A catalytic process is provided for effecting selective hydrogenation and hydrocracking of coke oven light oil containing 10 to 50% primary oil. Heating the light oil with hot recycle and the hydrogen, and immediate introduction into contact with hydrogenation catalyst at upflow liquid phase conditions substantially reduces the coke-forming tendencies of nonaromatic unsaturated components in the light oil. Subsequent catalytic hydrodealkylation produces improved yields of high purity aromatics. In one embodiment provision is made for the recovery of naphthalene.

3,564,068
DEMETHYLATION WITH BIMETALLIC COMPLEX CATALYSTS

Wolfram R. Kroll, Somerville, N.J., assignor to Esso Research and Engineering Company, a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 718,007, Apr. 1, 1968. This application Sept. 29, 1969, Ser. No. 862,082

Int. Cl. C07c *3/58;* **C10g** *13/02*

U.S. Cl. 260—672 **14 Claims**

Hydrocarbon compounds can be demethylated in the presence of hydrogen and a novel solid, reduced bimetallic catalyst prepared by reacting dimethyl or trimethyl aluminum derivatives with compounds of iron, cobalt, or nickel. The reaction may be utilized to remove one or more methyl or methylene groups from aliphatic, alkyl aromatic or alicyclic compounds, thereby reducing the carbon number of such compounds. In a preferred embodiment the reaction takes place at a reduced temperature.

3,564,069

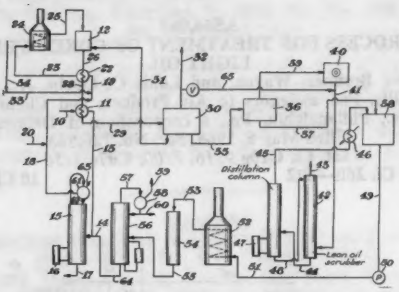
PURIFICATION OF BENZENE

George R. Jungerman, Donald A. Rikard, and Bobby A. Weaver, Lake Jackson, Tex., and Edwin H. Ivey, Jr., Whittier, Calif., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

Continuation-in-part of application Ser. No. 648,707, June 26, 1967. This application Oct. 22, 1969, Ser. No. 868,558

Int. Cl. C07c *3/00, 3/58*

U.S. Cl. 260—672 8 Claims



High purity benzene can be produced from by-product aromatic streams rich in benzene by thermal treatment of the crude benzene-rich by-product aromatic material in admixture with alkyl aromatic such as toluene, under hydrodealkylation conditions in the absence of any catalytic material. The process permits the purification of the crude benzene simultaneously with the hydrodealkylation of the alkyl aromatic component to benzene.

3,564,070

PRODUCTION OF 2-METHYL-2-PENTENE

Ernest H. Drew, Corpus Christi, Tex., and Arthur H. Neal, Baton Rouge, La., assignors to Esso Research and Engineering Company, a corporation of Delaware

No Drawing. Filed Apr. 18, 1967, Ser. No. 631,607

Int. Cl. C07c *3/10*

U.S. Cl. 260—683.15 6 Claims

A process in which propylene is dimerized with high selectivity to produce, in one step, reaction product mixtures rich in 2-methyl-2-pentene, a precursor for isoprene. Propylene is dimerized at relatively low pressure and temperatures in the presence of a catalytic mixture of transition metal acetyl acetonate and an alkyl aluminum halide. The transition metal acetyl acetonate, the metal of which is selected from nickel, cobalt and iron, and the alkyl aluminum halide react with an olefin promoter to generate the active catalyst. Selectivity to favor increased yields of 2-methyl-2-pentene, in the presence of the catalyst complex, increases with increased aluminum:transition metal ratios and also with increasing solvent polarity.

3,564,071

PROCESS FOR DIMERIZATION OF α-OLEFINS

Shoichi Izawa, Shizuo Yamada, and Yaichiro Ono, Yamaguchi-ken, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi-ken, Japan

No Drawing. Filed Oct. 11, 1968, Ser. No. 766,969

Claims priority, application Japan, Oct. 19, 1967, 42/67,333

Int. Cl. C07c *3/10*

U.S. Cl. 260—683.15 12 Claims

Process of catalytic dimerization or co-dimerization of α-olefins comprising ethylene and/or propylene in the presence of the complex catalyst consisting of organoaluminum compounds and at least one of titanates selected from the group consisting of tri-alkyltitanates and tetra-aryltitanates (e.g. tetra-phenyltitanates and/or tetra-tolyltitanate et al.).

3,564,072

ETHYLENE DIMERIZATION

Walter A. Butte, Jr., West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa., a corporation of New Jersey

No Drawing. Filed May 6, 1969, Ser. No. 822,312

Int. Cl. C07c *3/18*

U.S. Cl. 260—683.15 5 Claims

Ethylene is dimerized by contact at a temperature in the range of −40° to 100° C., preferably −10° to 50° C., with novel catalyst systems formed by combining (1) certain types of nickel (II) phosphine coordination complexes; (2) inorganic Lewis acids such as $AlCl_3$, BF_3, $AlBr_3$, etc.; and (3) an excess of a phosphine. The proportions of the catalyst components are such that the atomic ratio of Al:Ni is in excess of 2:1, the molar ratio of Lewis acid:phosphine is in the range of 2.5:1 to 3.5:1, and the catalysts are used in solution in a suitable liquid medium, e.g., chlorobenzene.

3,564,073

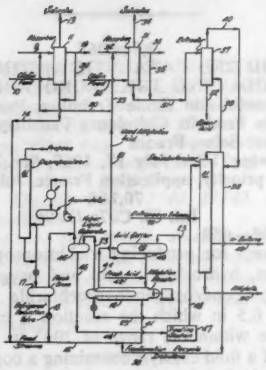
MULTIPLE ABSORPTION ZONES FOR ACID RECOVERY IN ALKYLATION

Arthur R. Goldsby, Chappaqua, N.Y., assignor to Texaco Development Corporation, a corporation of Delaware

Continuation-in-part of applications Ser. No. 510,904, Dec. 1, 1965, and Ser. No. 516,448, Dec. 27, 1965, both which are continuations-in-part of application Ser. No. 386,486, July 28, 1964, now Patent No. 3,234,301, which is a continuation-in-part of application Ser. No. 50,161, Aug. 17, 1960. This application June 1, 1967, Ser. No. 642,739

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.62 5 Claims



This invention and this disclosure relate to a process using a sulfuric acid catalyst for the alkylation of isobutane with an olefin to give a low catalyst consumption and a reduced amount of conventional fractionation. Olefin is removed from an olefin feed containing inerts by absorption in used sulfuric alkylation acid. The inerts are discharged from the system prior to alkylation and the acid containing absorbed olefins is charged to alkylation. Olefin is reacted with another portion of used alkylation acid containing alkylation contaminants to form alkyl sulfates. The alkyl sulfates are extracted from the alkylation contaminants with isobutane and charged to alkylation.

3,564,074

THERMOSETTING VINYL RESINS REACTED WITH DICARBOXYLIC ACID ANHYDRIDES

David H. Swisher and David C. Garms, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

No Drawing. Filed Nov. 28, 1966, Ser. No. 597,233
Int. Cl. C08f 45/04
U.S. Cl. 260—837 13 Claims

The present invention relates to new thermosetting resin compositions prepared by reacting a polyepoxide with an ethylenically unsaturated monocarboxylic acid and then reacting a dicarboxylic acid anhydride with the secondary hydroxyl groups formed by the epoxide-carboxylic acid interaction. The resin may be blended with a polymerizable monomer.

3,564,075

POLYAMIDES WITH IMPROVED TRANSPARENCY CONTAINING POLYVINYL PYRROLIDONE

Karl Heinz Hermann and Kurt Schneider, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany

No Drawing. Continuation-in-part of application Ser. No. 624,223, Mar. 20, 1967. This application Mar. 7, 1969, Ser. No. 805,374
Int. Cl. C08g 41/04
U.S. Cl. 260—857 4 Claims

Polyamides having improved transparency containing 0.001 to 10% by weight of a polyvinyl pyrrolidone having a molecular weight of about 800,000 or higher.

3,564,076

POLYMERS STABILIZED WITH POLYESTERS OF THIODIPROPIONIC ACID

Otto S. Kauder, Queens, N.Y., assignor to Argus Chemical Corporation, Brooklyn, N.Y., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 446,422, Apr. 7, 1965, now Patent No. 3,255,136, which is a continuation-in-part of applications Ser. No. 32,087, May 27, 1960, now Patent No. 3,244,650; Ser. No. 36,118, June 15, 1960; and Ser. No. 182,634, Mar. 26, 1962, now Patent No. 3,297,629. This application June 7, 1966, Ser. No. 555,714
Int. Cl. C08f 45/58; C08g 51/58
U.S. Cl. 260—870 14 Claims

Polymeric compositions are provided which have increased stability against deterioration in physical properties over long periods of time due to the presence of polymeric esters of thiodipropionic acid and polyols. The polymeric materials containing the polyesters of thiodipropionic acid and polyols, as well as a process for stabilizing polymeric materials by incorporating such polyesters therein are claimed.

The polyesters of thiodipropionic acid and a polyol have the formula:

$$Z_1[OY]_{n1}[OOCCH_2CH_2SCH_2CH_2COOYO]_{n2}[OCCH_2CH_2SCH_2CH_2COO]_{n3}Z_2$$

in which:

Z_1 and Z_2 are selected from the group consisting of hydrogen; a polyvalent metal M of Group II of the Periodic Table; a group R selected from the group consisting of hydrocarbon radicals, oxyhydrocarbon radicals, and thiohydrocarbon radicals having from one to twenty carbon atoms; a group R_3CO, where R_3 is a hydrocarbon or epoxyhydrocarbon group having from one to twenty carbon atoms; and YOH;

Y is selected from the group consisting of bivalent hydrocarbon, oxyhydrocarbon, and thiohydrocarbon groups having from two to twenty carbon atoms. The Y bivalent radical can be for example alkylene, alkenylene, cycloalkylene, alkylene-oxyalkylene, mixed alkylene-cycloalkylene; oxyalkylene; and thioalkylene.

n_2 is a number within the range from one to about twenty; n_1 and n_3 are zero or one, and n_2+n_3 is at least two.

3,564,077

THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS

Ludwig Brinkmann and Walter Herwig, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany, a corporation of Germany

No Drawing. Filed July 11, 1968, Ser. No. 743,945
Claims priority, application Germany, July 20, 1967, F 53,033
Int. Cl. C08g 39/10
U.S. Cl. 260—873 7 Claims

Molding compositions which can be processed thermoplastically and which have a high impact strength are prepared from linear saturated polyesters and copolymers of styrene and conjugated aliphatic dienes.

3,564,078

ALPHA-CYANOACRYLATE ADHESIVE COMPOSITIONS

Thomas H. Wicker, Jr., and John M. McIntire, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey

No Drawing. Filed May 17, 1968, Ser. No. 729,905
Int. Cl. C08f 15/16
U.S. Cl. 260—881 2 Claims

Alpha-cyanoacrylate adhesive compositions for surgical and other uses containing poly(ethyl 2-cyanoacrylate) as a viscosity modifier and an acidic component or a free radical scavenger as a polymerization inhibitor.

3,564,079

METHOD OF IMPROVING THE TACK OF ETHYLENE-PROPYLENE POLYMERS

Anthony C. Soldatos, Kendall Park, N.J., assignor to Union Carbide Corporation, a corporation of New York

No Drawing. Filed Jan. 30, 1968, Ser. No. 701,574
The portion of the term of the patent subsequent to Jan. 20, 1987, has been disclaimed
Int. Cl. C08d 9/08
U.S. Cl. 260—889 8 Claims

This invention relates to a method of improving the tack of ethylene-propylene polymers by adding thereto a polymer of isoprene and subjecting the resultant compositions to a heating cycle under controlled conditions of temperature and humidity.

3,564,080

VULCANIZABLE COMPOSITIONS COMPRISING A MAJOR PORTION OF EPR OR EPDM AND A MINOR PORTION OF AMORPHOUS POLYPROPYLENE

Giovanni Pedretti, Ferrara, Gino Panciroli, Bologna, and Augusto Portolani, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy, a corporation of Italy

No Drawing. Continuation-in-part of application Ser. No. 438,373, Mar. 9, 1965. This application July 9, 1968, Ser. No. 743,329
Claims priority, application Italy, Mar. 10, 1964, 5,262/64; June 25, 1964, 13,972/64
Int. Cl. C08f 37/18
U.S. Cl. 260—897 11 Claims

Vulcanizable high molecular weight elastomer compositions comprising (1) a high molecular weight vulcanizable elastomer selected from (a) saturated copolymers of ethylene and propylene or butene-1, and (b) low-unsaturation terpolymers of ethylene, propylene and a non-conjugated

polyene, (2) an extender comprising from about 1 to 90 parts of substantially amorphous polypropylene per 100 parts of said vulcanizable elastomer; and (3) a curing agent.

3,564,081

PROCESS FOR PREPARATION OF CERAMICS OF FISSIONABLE MATERIALS

Bernard François, Grenoble, and Roger Gremeret, Saint-Egreve, France, assignors to Commissariat a l'Energie Atomique, Paris, France, a French organization

Filed Mar. 7, 1968, Ser. No. 716,258
Claims priority, application France, Mar. 9, 1967, 98,181
Int. Cl. G21c *21/00, 21/02, 21/04*
U.S. Cl. 264—.5 **11 Claims**

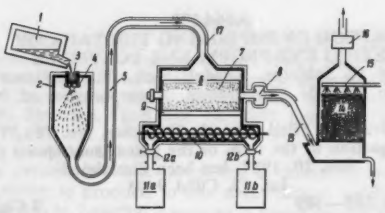
Starting from a powder, especially a powder of uranium oxide, a first compression at a pressure P is carried out so as to obtain granules of desired size. Then, after crushing these granules and sifting, a second compression at a pressure *p* lower than P is carried out. Finally, sintering is carried out, for example between 1300° C. and 1700° C. This leads to porous ceramics having open porosity, which porosity appears to be higher as the difference *P—p* is greater.

3,564,082

PROCESS FOR PRODUCING POWDERED LIGHT METALS, PARTICULARLY ALUMINUM

Werner Kartenbeck, Hamburg, Germany, assignor to Norddeutsche Affinerie, Hamburg, Germany, a corporation

Filed July 17, 1968, Ser. No. 745,637
Claims priority, application Germany, July 18, 1967, N 30,922
Int. Cl. B01j *2/02*
U.S. Cl. 264—12 **8 Claims**



Improvement in the known process for producing powdered metal by atomizing a melt thereof with steam followed by separating the powder from the steam which includes utilizing substantially dry super-heated steam for atomization and providing all surfaces into which the steam comes in contact at a temperature such that substantially no condensation of the steam occurs.

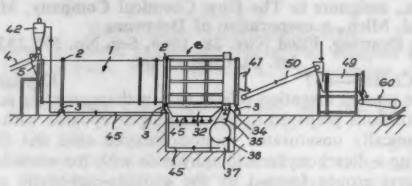
3,564,083

FORMATION OF FIBROUS GRANULES

Jean Fournet, Saint-Romain-en-Gal, and Guy J. Jacquelin, Grenoble, France, assignors to Societe d'Exploitation des Brevets Granofibre-Sebreg, Paris, France, a company of France

Filed Mar. 27, 1969, Ser. No. 810,960
Claims priority, application France, Mar. 27, 1968, 145,632
Int. Cl. B01j *2/12*
U.S. Cl. 264—37 **12 Claims**

A method of forming granules of a fibrous texture and according to the invention, fibres having a certain moisture content are collected together and agitated in a dry state in order to form roughly organised fibre masses which are then placed in suspension in a liquid, this suspension then being subjected to turbulence produced by a rotational movement which, if desired, may be combined with a pulsing movement.



3,564,084

RECOVERING POZZOLANIC MATERIAL, A CARBON CONCENTRATE, AN IRON CONCENTRATE AND SINTERED AGGREGATE FROM FLY ASH

John T. Pennachetti, 190 Woodside Drive, St. Catharines, Ontario, Canada, and Joseph F. Boux, 838 Eagle Drive, Burlington, Ontario, Canada

No Drawing. Original application Dec. 4, 1967, Ser. No. 687,465. Divided and this application Nov. 27, 1968, Ser. No. 786,801
Int. Cl. C04b *31/02, 31/10*
U.S. Cl. 264—44 **7 Claims**

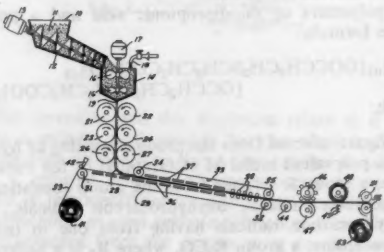
Fly ash is subjected to a magnetic separation to remove an iron concentrate product. The remainder is then subjected to air classification to remove a fine pozzolanic material with at least 85% of the particles being minus 325 mesh. The remaining heavy ends are dry screened over a 100 to 150 mesh screen to remove a coarse product containing at least 25% carbon. The precise dry screen size is selected from the range of 100–150 mesh to maintain the carbon content in the —100 to —150 mesh sinter fraction within the range of 5 to 8%. The sinter fraction, if necessary, is blended with sufficient amounts of pozzolanic material to reduce the iron content to below 10%, pelletized and sintered at 1900° F. to 2800° F.

3,564,085

METHOD FOR MAKING HEAT SEALABLE FOAMS

Erich Schickedanz, Illereichen-Altenstadt, Germany, assignor to The Schoff Mfg. Co., Inc., Chicago, Ill., a corporation of New York

Filed Nov. 17, 1966, Ser. No. 595,236
Int. Cl. B29h *8/00*
U.S. Cl. 264—47 **3 Claims**



A method of forming a heat and high frequency sealble foam composition by mixing discrete particles of a on-heat-sealable polyurethane foam and a heat gellable plastisol of polyvinyl chloride thermoplastic resin. The

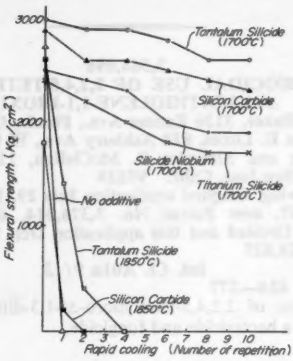
mixture is pressed into a sheet and heated to the gelling temperature of the plastisol to form the heat sealable and high frequency sheet.

3,564,086

METHOD OF MAKING A THERMAL SHOCK RESISTANT BERYLLIUM OXIDE COMPOSITE

Susumu Nishigaki and Kazuo Kobayashi, Nagoya, Hiroshige Mizuno, Aichi-ken, and Takehiro Kajihara, Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan, a corporation of Japan

Filed May 18, 1967, Ser. No. 639,578
Int. Cl. C04b *35/08, 35/56, 35/58*
U.S. Cl. 264—60 1 Claim



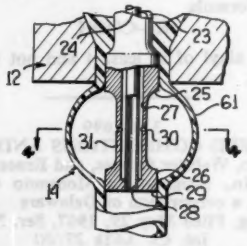
A method of making a beryllium oxide composite having a multi-phase structure of an oxide polycrystalline phase and a non-oxide crystal phase with a gap or cracks being formed between the two phases and between each oxide polycrystalline phase. This is accomplished by shaping a mixture of 0.5–15% by weight of at least one high melting carbide, boride, or silicide selected from the group consisting of titanium, zironium, niobium, tantalum, chromium, molybdenum, tungsten and vanadium, and silicon carbide the remainder being beryllium oxide, and firing the shaped mixture to 1700° C.

3,564,087

EXTRUSION OF PLASTIC TUBING WITH CONTROLLED VARIABLE DIAMETER

Herbert S. Ruekberg, Highland Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York

Filed June 7, 1968, Ser. No. 735,417
Int. Cl. B29c *17/07, 23/00*
U.S. Cl. 264—89 24 Claims



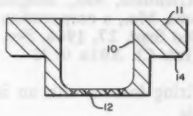
This disclosure relates to the extrusion of plastic tubing having localized variations in diameter, due to the introduction of variable fluid pressure inside the tubing, and the subsequent blow-molding of the localized variable diameter extrusion to form a bottle having integral hollow handles which are free of flash exteriorly of a mold handle parting line.

3,564,088

PROCESS FOR FLASH SPINNING AN INTEGRAL WEB OF POLYPROPYLENE PLEXIFILAMENTS

Rudolph Woodell, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Continuation-in-part of application Ser. No. 768,617, Oct. 15, 1968, now Patent No. 3,467,744, which is a continuation-in-part of abandoned application Ser. No. 506,304, Nov. 14, 1965. This application Sept. 3, 1969, Ser. No. 854,920
The portion of the term of the patent subsequent to Sept. 16, 1986, has been disclaimed
Int. Cl. D01f *7/02*
U.S. Cl. 264—205 7 Claims



A web of entangled plexifilaments of isotactic polypropylene is obtained by flash spinning a solution of the polymer through two or more closely-spaced spinneret orifices. Depending upon arrangement of the orifices, the web may be a yarn or tow of shaped cross-section, or it may be a ribbon or sheet product. The solvent may be 1,1,2-trichloro - 1,2,2 - trifluoroethane, trichlorofluoromethane or a mixture thereof.

3,564,089

DIAGNOSTIC REAGENT FOR SYPHILIS

Sandra Jean Kiddy, 1245 Doremus Road, Pasadena, Calif. 91105

No Drawing. Filed Sept. 29, 1966, Ser. No. 583,065
Int. Cl. G01n *31/00, 31/02, 33/16*
U.S. Cl. 424—13 1 Claim

A reagent and method for the serological diagnosis of syphilis by determining the agglutination of antigen-coated latex particles with a patient's serum in which the reagent used in the diagnosis consists of polystyrene latex having a particle size of from about 0.1 to about 0.35 micron coated with a combination of from about 0.007 mg. to about 0.187 mg. of cardiolipin and from about 0.0005 mg. to about 0.03 mg. Reiter protein antigen per mg. of latex solids.

3,564,090

ANTIBIOTIC MACARBOMYCIN AND PROCESS OF MAKING AND USING SAME

Hamao Umezawa, Kenji Maeda, Kazuo Nitta, Masanori Okanishi, and Sakiko Takahashi, Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkya Kai, Tokyo, Japan, a corporation of Japan

Filed Dec. 12, 1968, Ser. No. 783,325
Claims priority, application Japan, Dec. 18, 1967, 42/81,437
Int. Cl. A61k *21/00*
U.S. Cl. 424—118 7 Claims

Macarbomycin inhibits the growth of various microorganisms e.g., *Staphylococcus aureus* including bacteria

resistant against various drugs and exhibits growth promoting activity for animals. The antibiotic macarbomycin is produced by fermentation of species of Streptomyces which has been classified *Streptomyces phaeochromogenes.*

3,564,091

PROCESS FOR KILLING BACTERIA AND FUNGI WITH ARALKANOL ESTERS OF BORIC ACID AND GLYCOL BORATES

Richard J. Degray, South Euclid, and William O. Fitzgibbons, Hudson, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio, a corporation of Ohio

No Drawing. Filed May 13, 1966, Ser. No. 549,798

Int. Cl. A01n *9/00; A61l 13/00, 23/00*

U.S. Cl. 424—185 **6 Claims**

Boric acid esters of aralkanols containing 2 to 3 carbon atoms, and esters of said aralkanols with 1–2 or 1–3 glycol monoborates which are easily formed and incorporated int› water, hydrocarbon, animal or vegetable oil media, are effective in killing substantially all bacteria and fungi in about half an hour even when present in very low concentrations.

3,564,092

METHOD OF STERILIZING INSECTS WITH ISOTHIOCYANO-s-TRIAZINES

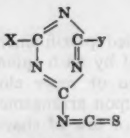
Philip C. Hamm, Glendale, Mo., assignor to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Filed Sept. 27, 1966, Ser. No. 582,248

Int. Cl. A01n *9/22*

U.S. Cl. 424—249 **4 Claims**

Method of sterilizing insects with an isothiocyano triazine of the formula



3,564,093

USE OF PENTAMETHYLENE QUINOXALINE DIOXIDES AS ANTIBACTERIAL AGENTS AND ANIMAL GROWTH PROMOTANTS

James David Johnston, Old Saybrook, Conn., assignor to Chas. Pfizer & Co., Inc., New York, N.Y., a corporation of Delaware

No Drawing. Application Oct. 18, 1966, Ser. No. 587,422, now Patent No. 3,471,492, dated Oct. 7, 1969, which is a continuation-in-part of abandoned application Ser. No. 463,932, June 14, 1965. Divided and this application Jan. 6, 1969, Ser. No. 803,514

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 **6 Claims**

A series of 7,8,9,10-tetrahydro-6H-cyclohepta[b]quinoxaline-5,11-dioxides and non-toxic salts thereof useful as antibacterial agents and as animal growth promotants.

3,564,094

METHOD OF TREATING VENOUS DISEASES

Karl Dietmann, Mannheim-Waldhof, Gunter Steinorth, Mannheim - Feudenheim, and Wolfgang Schaumann, Mannheim-Waldhof, Germany, assignors to Boehringer Mannheim Gesellschaft mit beschrankter Haftung

Filed Jan. 26, 1968, Ser. No. 700,875

Claims priority, application Great Britain, Feb. 10, 1967, 6,396/67

Int. Cl. A61k *27/00*

U.S. Cl. 424—262 **8 Claims**

Novel therapeutic compositions containing raubasine and a method of using the same in the treatment of venous diseases, including thrombosis, varicosis, non-cardiac edema, ulcus cruris varicosum and peripheral circulatory disturbances.

3,564,095

ANTI-INFLAMMATORY HYDROXY CYCLIC SULFONES

Lewis H. Sarett, Princeton, Tsung-Ying Shen, Westfield, and Conrad P. Dorn, Jr., Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J., a corporation of New Jersey

No Drawing. Continuation-in-part of application Ser. No. 476,695, Aug. 2, 1965. This application June 21, 1968, Ser. No. 738,800

Int. Cl. A01n *9/12*

U.S. Cl. 424—275 **2 Claims**

This invention relates to certain cyclic hydroxy alkylene sulfones and their method of preparation. These compounds have been found to exhibit pharmaceutical activity as anti-inflammatory agents.

3,564,096

MICROBIOCIDAL USE OF 2,2,4,5-TETRACHLORO-Δ^4-1,3-DITHIOLENE-1,1-DIOXIDE

Don R. Baker, 3136 Estates Ave., Pinole, Calif. 94564; George E. Lukes, 828 Ashbury Ave., El Cerrito, Calif. 94530; and Malcolm B. McClellan, 1112 Arlington Lane, San Jose, Calif. 95129

No Drawing. Original application July 29, 1964, Ser. No. 386,067, now Patent No. 3,376,314, dated Apr. 2, 1968. Divided and this application Oct. 11, 1967, Ser. No. 729,827

Int. Cl. A01n *9/12*

U.S. Cl. 424—277 **1 Claim**

The use of 2,2,4,5-tetrachloro-Δ^4-1,3-dithiolene-1,1-dioxide as a bactericide and fungicide.

3,564,097

STABLE MULTIVITAMIN TABLETS CONTAINING TRICALCIUM PHOSPHATE

Louis Magid, 199 Haddenfield Road, Clifton, N.J. 07013

No Drawing. Filed Apr. 5, 1968, Ser. No. 719,235

Int. Cl. A61k *15/10*

U.S. Cl. 424—284 **2 Claims**

Sugar coated multivitamin tablets containing a high potency of vitamin E are stabilized against cracking and oil bleeding by the inclusion of tricalcium phosphate in the formulation in lieu of conventional excipients.

3,564,098

ANIMAL FEED COMPOSITIONS AND METHODS

Eugene S. Erwin, Phoenix, Ariz., and Gino J. Marco, Webster Groves, Mo., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Filed June 26, 1967, Ser. No. 648,993

Int. Cl. A61k *27/00*

U.S. Cl. 424—317 **5 Claims**

Animal feed composition containing at least one compound of the formula

R—COOH

wherein R is alkyl of at least 4 and not more than 11 carbon atoms.

3,564,099

ANIMAL FEED COMPOSITIONS AND METHODS

Gino J. Marco, Webster Groves, and Ernest G. Jaworski, Olivette, Mo., assignors to Monsanto Company, St. Louis, Mo., a corporation of Delaware

No Drawing. Filed May 29, 1967, Ser. No. 642,139

Int. Cl. A61k *27/00*

U.S. Cl. 424—320 **17 Claims**

Animal feed compositions containing α-haloacetamides elicit substantially greater weight gain and feed efficiency response in animals than said diets used alone due to the growth promoting properties of the said α-haloacetamides.

3,564,100

BASICALLY SUBSTITUTED CYCLOALKENE COMPOUNDS AS ANTITUSSIVE AGENTS

Ernst Frankus, Schleckheim, and Kurt Flick, Bochum-Stiepel, Germany, assignors to Chemie Grunenthal G.m.b.H., Stolberg, Germany

No Drawing. Original application July 6, 1966, Ser. No. 563,044, now Patent No. 3,470,249, dated Sept. 30, 1969. Divided and this application Sept. 26, 1969, Ser. No. 870,804

Int. Cl. A61k *27/00*

U.S. Cl. 424—330 2 Claims

The antitussive composition which comprises specific cycloalkene compounds and a pharmaceutical excipient.

3,564,101

1,1-DICHLORO-2,3,3-TRIFLUOROPROPENE AS AN ANESTHETIC AGENT

Bernard M. Regan, Chicago, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill., a corporation of Delaware

No Drawing. Original application Jan. 18, 1968, Ser. No. 698,703, now Patent No. 3,499,048, dated Mar. 3, 1970. Divided and this application Oct. 1, 1969, Ser. No. 870,976

Int. Cl. A61k *13/00*

U.S. Cl. 424—351 1 Claim

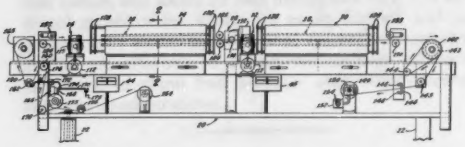
1,1-dichloro-2,3,3-trifluoropropene, useful as a general anesthetic.

ELECTRICAL

3,564,102
WIRE HEATING APPARATUS

Sheridan S. Cannaday, Pasadena, Calif., assignor to Physical Sciences Corporation

Original application Apr. 19, 1963, Ser. No. 277,975, now Patent No. 3,403,659, which is a division of application Ser. No. 46,576, Aug. 1, 1960, now Patent No. 3,257,245. Divided and this application Aug. 31, 1967, Ser. No. 683,037
Int. Cl. H05b *3/62*
U.S. Cl. 13—20 6 Claims

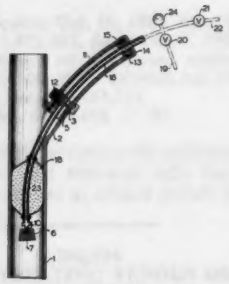


A furnace for processing a traveling wire to avoid tensioning to any significant degree and to maintain a substantially constant temperature. A refractory mass is formed with a tubular opening for providing a passageway for the wire. A pulling device is located at the other end for pushing the wire therethrough. A number of heating elements are enclosed in the mass surrounding the opening and are energized by a pair of transformers to maintain a predetermined temperature range.

3,564,103
SHUTOFF DEVICE FOR HOLLOW ELECTRODES

Albert Brachschob, Hurth near Cologne, and Heinrich Weiler, Hermulheim near cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack bei, Cologne, Germany

Filed Aug. 26, 1969, Ser. No. 853,098
Claims priority, application Germany, Sept. 28, 1968, P 17 83 075.0
Int. Cl. F27b *1/20;* H05b *3/60*
U.S. Cl. 13—33 10 Claims

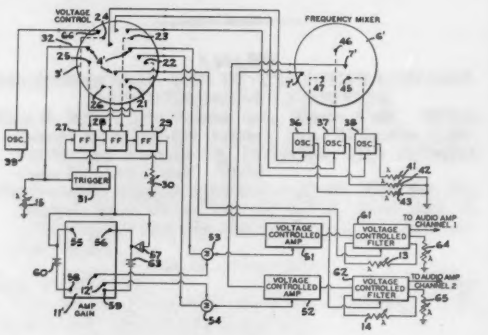


Shutoff device for hollow electrodes supplying particulate feed material to and/or removing furnace gas from electrothermal reduction furnaces, arc melting furnaces, e.g., calcium carbide or similar furnaces. The inner shell of the hollow electrode has an inclined pipe socket secured to it, preferably welded thereto, which in turn has detachably secured to it a sleeve with an inflatable bag therein. The bag is displaceable by means of a thrust rod from inside the sleeve to a position inside the hollow electrode, and inflated therein using gas under pressure to effect shutoff of the hollow electrode.

3,564,104
MOVABLE CONTACT CONTROL OF ELECTRONIC MUSIC MODULES

Thomas B Reynolds, 2339 Columbia St., Palo Alto, Calif. 94306

Filed Apr. 2, 1969, Ser. No. 812,611
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 15 Claims

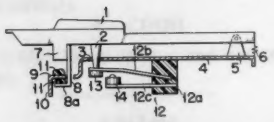


An electronic musical instrument including a first resistive surface to which a number of control signals are applied in physically spaced relation and from which variable oscillator control signals are picked up by movable contacts on the first resistive surface. Preferably, the oscillator signals are delivered to a second resistive surface so that additional movable contacts thereon can be shifted to vary the mixed oscillator signals.

3,564,105
ELECTRONIC MUSICAL INSTRUMENT KEY ASSEMBLY WITH PRESSURE SENSITIVE RESISTOR

Hiroshi Amano, and Seiji Nakada, Hamamatsu-shi, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed June 25, 1969, Ser. No. 836,559
Claims priority, application Japan, July 1, 1968, 43/45402;43/45403
Int. Cl. G10c *3/12;* G10h *1/00*
U.S. Cl. 84—1.01 3 Claims



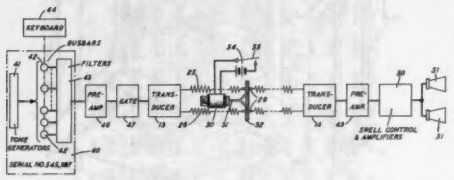
A key assembly involves a plurality of keying switches, each of which is provided with a stationary contact element and a movable contact element cooperable at their contact point. Said movable contact element has a weight block disposed at the free end thereof and is elastically bendable by an actuating member mounted on the bottom side of a key member. At the contact point of the stationary contact element is positioned a sensor whose electric resistance makes varying responses in accordance with the magnitude of pressure applied thereto.

3,564,106

ELECTRONIC ORGAN EMPLOYING A REVERBERATION UNIT WITH VARIABLE DECAY TIME

Leonard W Pavia, 460 Columbia Turnpike, Florham Park, N.J. 07932

Filed May 7, 1969, Ser. No. 822,468
Int. Cl. G10h 1/02
U.S. Cl. 84—1.24 12 Claims



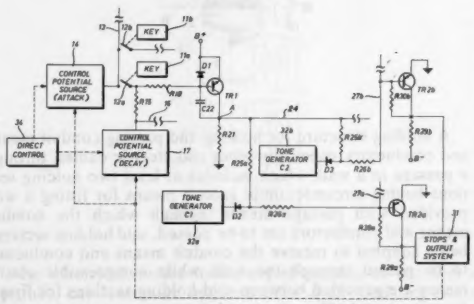
An electronic organ in which all of the tones generated are applied through an artificial reverberation unit to the output speakers. The reverberation unit includes a pair of coiled springs with a coupling section between two portions of each spring. The reverberation or decay time is varied by an adhesively coated wire which is controllably brought just to rest on the coupling section so as to adhesively grasp the section. Since all of the signal is passed through the springs, the tone generators may be designed to compensate for both the poor frequency and the poor tonal characteristics of the springs, whereby exceedingly low frequency tones can be transmitted through the reverberation unit and have their reverberation time controlled and the metallic sound usually associated with reverberation units obviated.

3,564,107

KEYING DRIVE CIRCUITS PARTICULARLY FOR ELECTRONIC MUSICAL INSTRUMENTS

Alfred B. Freeman, Skokie, Ill., assignor to Chicago Musical Instrument Co., Chicago, Ill.

Continuation of application Ser. No. 599,935, Dec. 7, 1966, now abandoned. This application Feb. 16, 1970, Ser. No. 010,087
Int. Cl. G10h 1/02
U.S. Cl. 84—1.26 29 Claims



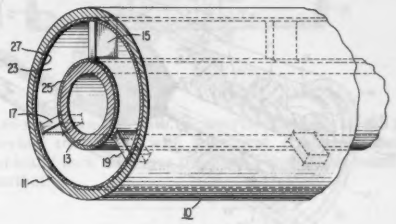
An apparatus is provided for producing a variable signal which utilizes a transistor, a capacitor connected between the base and the collector electrodes of the transistor, a first resistor connected in series with a switching means which are jointly connected between a first source of control potential and the base electrode, a second source of control potential connected via a second resistor to the base electrode, and means for developing an output signal at the collector electrode. By this circuit, when the switch means is closed, the rate of onset or attack of the output signal is linear, and when the switching means is opened, the rate of decay of the output signal is exponential.

3,564,108

COAXIAL TRANSMISSION LINE

Anthony Nicholas Schmitz, Moorestown, N.J., assignor to RCA Corporation, a corporation of Delaware

Filed Aug. 14, 1969, Ser. No. 850,081
Int. Cl. H01b 7/34
U.S. Cl. 174—16 5 Claims



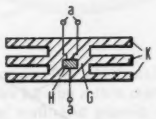
A coaxial transmission line having an increased average power rating compared to known lines is provided. This increased power rating is achieved by improving radiant heat transfer from the inner conductor to the outer conductor.

3,564,109

SEMICONDUCTOR DEVICE WITH HOUSING

Hugo Ruchardt, Gauting, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 20, 1968, Ser. No. 754,085
Claims priority, application Germany, Aug. 24, 1967, 111,507
Int. Cl. H01l 1/12
U.S. Cl. 174—15 2 Claims



The present invention relates to a semiconductor device with housing and with a cooling device particularly cooling ribs provided at the housing wall. The invention is characterized by the fact that the cooling device and the adjacent housing portion are comprised of a single piece of heat-conducting synthetic material. The technical progress derived from the invention is realized to a particularly full extent if the cooling device and the adjacent housing portion are produced in a single work process by injection molding.

3,564,110

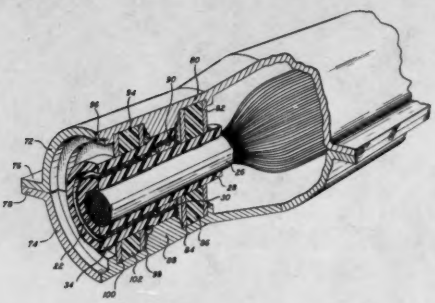
ELECTRICAL CABLES

Merle C. Biskeborn, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Continuation of application Ser. No. 599,599, Dec. 6, 1966. This application Jan. 31, 1969, Ser. No. 798,253
Int. Cl. H01b 7/18; H02g 15/24
U.S. Cl. 174—22 2 Claims

Entry of water and water vapor into the core and splice case of a cable is avoided, despite the puncturing effect of lightning, by surrounding the core with an overlapped-seam plastic-coated aluminum vapor barrier which is bonded to a surrounding polyethylene tube thick enough to withstand the inner radial force of a sealing gland in a splice case without

distorting and leaking. Surrounding this tube and vapor barrier, to protect them from the effects of lightning, is a lightning-absorbing aluminum shield and an outer polyethylene jacket.

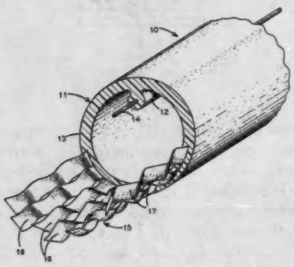


3,564,111

HIGH FREQUENCY TRANSMISSION LINE

Otto Breitenbach, Nurnberg, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Oct. 22, 1969, Ser. No. 868,496
Claims priority, application Germany, Oct. 23, 1968, P P 1,804,679
Int. Cl. H01b *11/06*
U.S. Cl. 174—36 7 Claims



A line for transmitting high frequency electrical signals, including video signals; the line being used to simultaneously transfer and radiate energy and including shielding means for reducing losses.

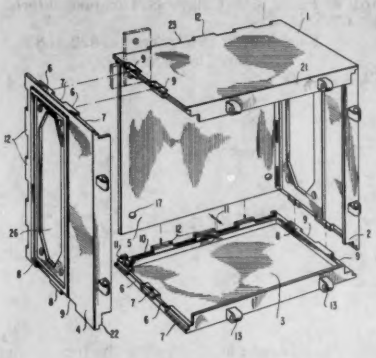
3,564,112

BOX FOR ENCLOSURE OF ELECTRICAL EQUIPMENT

Seven Erki Algotsson and Sune Hugo Ivan Lorentzon, Gavle, Sweden, assignors to A B Elektroverken i Gavle, Gavle, Sweden

Filed Mar. 4, 1969, Ser. No. 804,228
Claims priority, application Sweden, Mar. 6, 1968, 2952/68
Int. Cl. H05k *5/00*
U.S. Cl. 174—52 8 Claims

Box for enclosure of electrical equipment which is formed of sidewalls manufactured as separate elements by precision casting and of a bottom, each of which parts is sealed by a bonding agent with the adjoining sidewalls through engaging devices in the edges of the sidewalls.

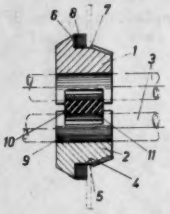


3,564,113

PASSAGE MEANS FOR PASSING PIPES, CABLES AND THE LIKE THROUGH WALLS

Georg Kindler, Bremen-Vegesack, Germany assignor to Vereinigte Flugtechnische Werke Gesellschaft mit beschrankter Haftung fruher "Weser" Flugzeugbau/Focke-Wolf Heinkel-Flugzeugbau, Bremen, Germany

Filed Apr. 1, 1969, Ser. No. 811,888
Claims priority, application Germany, Apr. 10, 1968, P 17 50 240.8
Int. Cl. F16l *5/00;* H02g *3/22*
U.S. Cl. 174—65 7 Claims



A holding structure for holding and passing conduit means and conductors, especially pipes and electric cables, through a passage in a wall, which includes at least two holding sections having circumferential groove means for fitting a wall provided with passage means through which the conduit means and conductors are to be passed, said holding sections being adapted to receive the conduit means and conductors to be passed through the wall, while compressible elastic means are provided between said holding sections for firmly engaging and holding the conduit means and conductors in said holding sections.

3,564,114

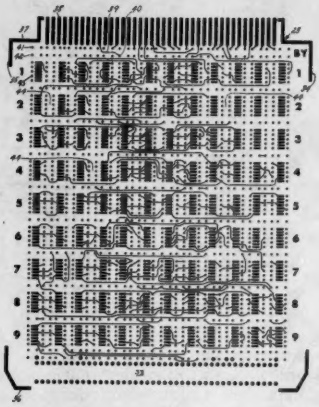
UNIVERSAL MULTILAYER PRINTED CIRCUIT BOARD

Marvin Blinder, Union, N.J., and Allen B. Chertoff, New York, N.Y.; said Blinder assignor to Loral Corporation, Scarsdale, N.Y.

Filed Sept. 28, 1967, Ser. No. 684,882
Int. Cl. H05k *1/04*
U.S. Cl. 174—68.5 2 Claims

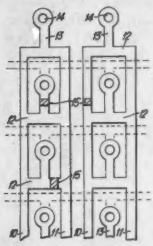
A prefabricated printed circuit board including a plurality of laminated planar-printed circuit-carrying members, each

of the printed circuits having points of connection which are placed in congruent relation upon lamination, and having exposed planar surfaces which are covered over the entire area thereof with an etchable electrically conductive material such as copper. When employed to connect a specific group



of components, the bonded layer is etched to a desired pattern, including points of electrical connection, following which the electrical components are mounted upon areas of the etched surface to be placed in electrical communication therewith.

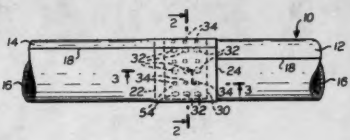
3,564,115
ELECTRICAL INTERCONNECTION GRIDS
Maurice Woolmer Gribble, Stockport, and Glyn Charles Evans, Wilmslow, England, assignors to Ferranti, Limited, Hollinwood, Lancashire, England
Filed Dec. 6, 1968, Ser. No. 781,930
Claims priority, application Great Britain, Dec. 8, 1967, 55818/67
Int. Cl. H05k *1/04*
U.S. Cl. 174—68.5 **5 Claims**



An electrical interconnection grid consists of two sets of parallel conductors on opposite sides of an insulating board. At least one set of conductors consists of pairs of conductors interconnected at intervals by a conductive strip which is connected to a conductor of the other set by a plated-through hole.

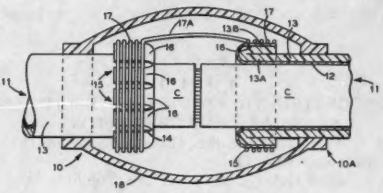
3,564,116
SPLICE FOR LAMINATED TAPES
Joseph B. Masterson, Carteret, N.J., and John D. Lawler, Bayonne, N.J., assignors to General Cable Corporation, New York, N.Y., a corporation of New Jersey
Filed May 7, 1969, Ser. No. 822,370
Int. Cl. H01r *9/06;* **H02g** *15/08*
U.S. Cl. 174—88 **14 Claims**

Shielding tapes around the cores of electrical cables are connected together by an electrically conductive strip placed between overlapping ends of the shielding tapes and with tangs projecting from both sides of the strip for piercing the corrosion-preventing coating on the tapes and establishing



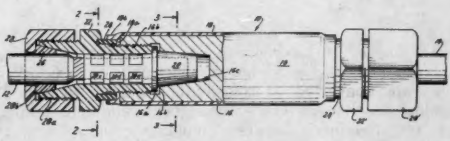
metal-to-metal contact with the overlapping ends of the tapes to provide the tapes with electrical continuity and to mechanically lock the tapes from axial movement relative to one another.

3,564,117
CABLE SPLICE CONSTRUCTION
Ernst Scheffler, Langenhagen, and Jurgen W. Luhring, Hannover, Germany, assignors to Kabel-und Metallwerke Gutehoffnung-shutte Aktiengesellschaft, Hannover, Germany
Filed Feb. 17, 1969, Ser. No. 799,636
Claims priority, application Germany, Feb. 20, 1968, K60326/21C
Int. Cl. H02g *15/08*
U.S. Cl. 174—89 **5 Claims**



A splice construction for electrical cables, particularly communication cables having a thin metallic sheathing carrying an outer layer of synthetic plastic, wherein the terminal portions of the metallic sheathing of a pair of cables to be spliced, is treated in a manner to facilitate their electrical interconnection yet leaving the cable cores unimpaired.

3,564,118
CABLE CONNECTOR FOR UNDERGROUND APPLICATIONS
Stephen P. Becker, Poughkeepsie, N.Y., assignor to Fargo Mfg. Company, Inc., Poughkeepsie, N.Y., a corporation of New York
Filed June 23, 1969, Ser. No. 835,432
Int. Cl. H01r *7/06;* **H02g** *15/08*
U.S. Cl. 174—93 **4 Claims**

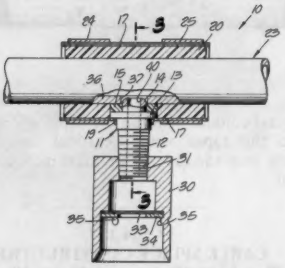


A rugged and compact cable connector for direct burial applications providing a permanent, watertight, insulated junction, including an electrically conducting member for providing direct metal to metal electrical contact between the cable and the body of the connector.

3,564,119
PRESSURE-EQUALIZING ACCESSORY FOR CABLES

John T. Thompson, 244 Loring St., Los Angeles, and George W. Gillemot, 2331 20th St., Santa Monica, Calif. 90405

Filed Nov. 24, 1969, Ser. No. 879,137
Int. Cl. H01b 7/00; H02g 15/00
U.S. Cl. 174—135 6 Claims

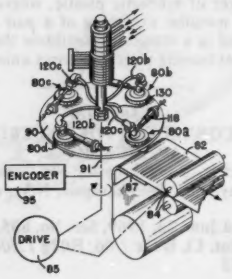


A cable-pressure-equalizing accessory having a cup-shaped member fixed to the outer end of a tubular fitting. The latter is equipped with adjustable split ring means for holding the tubular fitting seated in an opening through a cable sheath in a manner excluding moisture and foreign matter while equalizing the internal cable pressure with the ambient pressure.

3,564,120
IMAGE CONSTRUCTION SYSTEM WITH ARCUATELY SCANNING DROP GENERATORS

Richard P. Taylor, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 18, 1968, Ser. No. 768,800
Int. Cl. H04m 1/22
U.S. Cl. 178—5.2 9 Claims

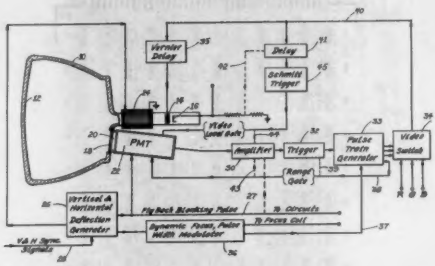


An image to be reproduced is repetitively optically scanned along successive arcuate lines and the density variations are converted to transmittable digital signals. The scanner may have several scanning heads and appropriate filters to differentiate between colors. A printer has a corresponding number of liquid drop generators scanning a receiving sheet in the same fashion. Individual drops are projected toward the sheet predestined for a certain coordinate location; the signals are received and buffered into the printer causing some drops to switch from their normal trajectory and be removed from the system, thus reproducing the image in dot-by-dot fashion.

3,564,121
SYSTEMS FOR MODULATION OF BEAM-INDEX COLOR CATHODE RAY TUBES, AND THE LIKE

David M. Goodman, 3843, Debra Court, Seaford, N.Y.

Filed Sept. 17, 1965, Ser. No. 488,017
Int. Cl. H04n 9/28; H01j 29/10
U.S. Cl. 178—5.4 32 Claims

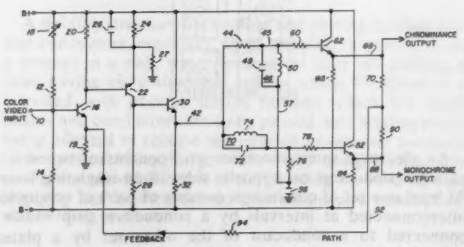


A rear-ported beam index color cathode ray tube is described with a plurality of means for accurately controlling the modulation applied to the electrodes thereof in order to control the quality of data presented on the tube. Electrical and optical means are described which improve the signal to noise ratio in the index signal deriving section of the receiver. This improvement is achieved via the individual and collective action of (1) target screens having low X-ray emitting and high X-ray emitting index strips, and (2) large area scintillators for detecting and filtering the index radiation, and (3) electrical circuit means for generating synchronizing signals which respond to selected portions of the index radiation and (4) timing circuits for sequentially enabling the development of the synchronizing signals, and (5) circuit means which respond to the input data signals, deflection signals, and the synchronizing signals to precisely control the waveshapes of modulating signals applied to the cathode ray tube.

3,564,122
VIDEO SIGNAL SEPARATION MEANS

Richard S. Wise, Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Filed Nov. 13, 1967, Ser. No. 682,392
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 11 Claims

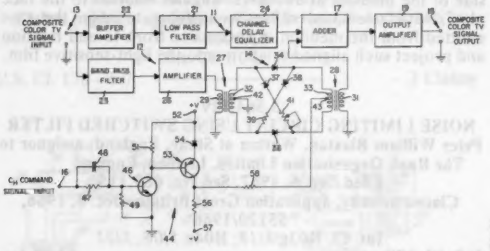


Apparatus for use in color television including a filter network for separation of color and monochrome signal components of a color television video signal, a resistive matrix for summing the monochrome and color components of the television signal and a path for feeding back the summation signal to the input of the circuit after recombining the separate components so as to minimize deterioration of signal quality due to imprecise frequency selection in the filter network.

3,564,123
CHROMA INVERTER

Evangelos I. Pezirtzoglov, Mountain View, Calif., assignor to Ampex Corporation, Redwood City, Calif., a corporation of California

Filed Mar. 18, 1968, Ser. No. 721,538
Int. Cl. H04n 5/78, 9/02
U.S. Cl. 178—5.4 14 Claims

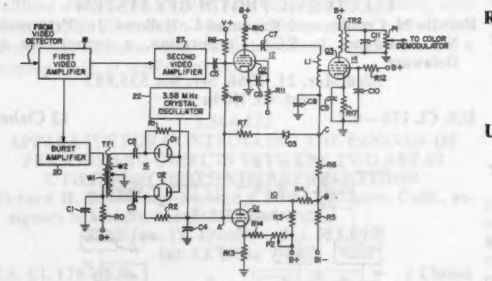


A circuit for inverting the phase of the chroma component of a composite color video signal, without altering the luminance or synchronizing pulse components thereof, in response to a command signal. The circuit is particularly useful in the slow- or stop-motion replay of color television signals recorded on a magnetic medium, such as a magnetic disc, wherein single fields of the composite color video signal are transmitted repeatedly and phase discontinuities would occur in the chroma component thereof at the beginning of each repeated field unless the phase of the chroma component is inverted relative to the luminance and synchronizing pulse components in a predetermined periodic manner.

3,564,124
CHROMA-GAIN CONTROL AND COLOR KILLER CIRCUITS

Richard G. Popovich, Georgetown, Mass., assignor to chroma-Gain control

Filed Apr. 10, 1968, Ser. No. 720,247
Int. Cl. H04n 9/84
U.S. Cl. 178—5.4 10 Claims

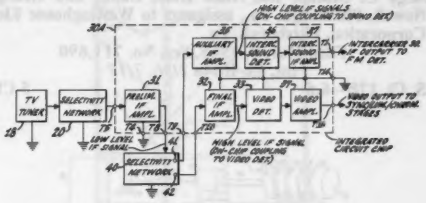


The present disclosure relates to color television receiver circuitry for performing the color killer function in the color receiver as well as applying automatic gain control to the chroma and band-pass amplifying stages. In response to control signals developed in the receiver, for example in the color killer detector thereof, the present circuit is operative when color signals are received to supply automatic gain control signals to both the chroma and band-pass amplifying stages to permit the chrominance signals to be amplified therein at the desired gain levels. When monochrome signals are received, the present circuit, in response to the control signals, is operative as a color killer to turn off the band-pass amplifier stage to prohibit spurious signals from being translated therethrough causing interference with the desired monochrome reception.

3,564,125
TELEVISION INTEGRATED I.F. AMPLIFIER CIRCUITS

Jack Avins, Princeton, N.J., assignor to RCA Corporation

Filed Mar. 3, 1969, Ser. No. 803,544
Int. Cl. H04n 5/44, 9/00
U.S. Cl. 178—5.8 17 Claims

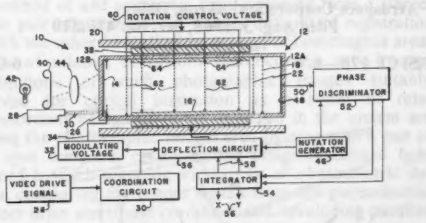


Television receiver arrangement permitting stable operation of monolithic integrated circuit (IC) intermediate frequency (IF) amplifier. A first selectivity network is interposed between the receiver's tuner and a preliminary IF amplifier section, while a second selectivity network is interposed between the preliminary IF amplifier section and a final IF amplifier section. An untuned, wide-band coupling is provided between the output of the final IF amplifier section and the video detector. The preliminary and final IF amplifier sections, the video detector and the untuned amplifier-detector coupling appear in integrated form on the same monolithic IC chip. In color television receiver embodiments, an auxiliary IF amplifier section is interposed between an output of the second selectivity network and an intercarrier sound detector; the auxiliary IF amplifier section, sound detector, and an untuned, wide-band coupling therebetween also appear in integrated form on the same monolithic IC chip with video detector, etc. In specific color television embodiments, additional functions of video amplification, intercarrier sound IF amplification, AGC potential derivation from video detector output, gain control of preliminary IF amplifier section, AFT drive and RF AGC delay are performed on the amplifier/detector IC chip.

3,564,126
ELECTRONIC WRITE IN AND IMAGE ROTATION CONTROL IN AN ELECTRONIC IMAGE CORRELATOR TUBE

Richard F. Koch, Cuyahoga Falls, Ermal E. Penix and John R. Shoemaker, Akron, Harry O. Pfeiffer and Richard H. Smith, North Canton, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Sept. 19, 1966, Ser. No. 580,273
Int. Cl. H04n 3/10
U.S. Cl. 178—6 6 Claims



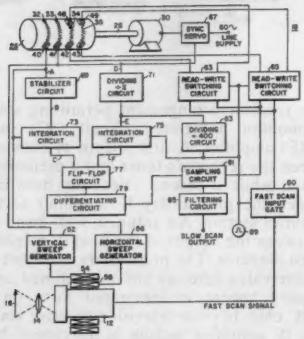
An electronic image correlation tube utilizing a partial grid modulated by video drive signal to write in electronic information for storage from a constant beam light source. The capability of also writing in optical input information by conventional means is incorporated. Correlation is achieved by a conventional means, but image rotation control is provided within the tube, together with a unique reference establishment between the input and stored information to facilitate correlation. Fiber optics may also be utilized between the

reference and the photo cathode to assist in providing more resolution to the input information.

3,564,127
SYSTEM OF BAND COMPRESSION FOR VIDEO SIGNALS

George C. Sziklai, Los Altos Hills, Calif., and George F. Newell, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1968, Ser. No. 711,690
Int. Cl. H04n *1/36, 7/12*
U.S. Cl. 178—6.6 **5 Claims**

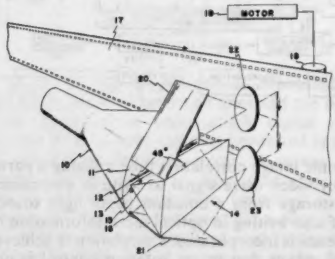


This invention relates to a method and system for band-compressing video signals including a continuous storage medium such as a magnetic disc or drum and a sampling circuit for variously reading or writing selected samples to and from the continuous storage medium. In converting a typical horizontally swept, fast-scan video signal to a slow-scan signal, the fast-scan video signal corresponding to an image is recorded upon the storage medium and is repeatedly played back while the sampling circuit samples elements of the signal corresponding to one element from each of the horizontal lines so that the resulting slow-scan, distributed signal appears as if the image were vertically scanned. In order to convert the slow-scan signal into a fast-scan signal, the distributed, slow-scan signals are selected by a sampling circuit and recorded onto a continuous storage medium during many revolutions of the storage medium until the entire fast-scan signal has been built-up in a manner that the recorded signal may be played back rapidly to provide a normal horizontal, fast-scan video signal.

3,564,128
MULTIPLE SCAN OPTICAL RECORDING APPARATUS

Harry L. Hosterman, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Aug. 3, 1965, Ser. No. 476,819
Int. Cl. H04n *3/00*
U.S. Cl. 178—6.7 **6 Claims**

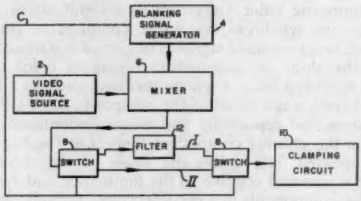


A multiple scan optical recording apparatus combined with a procedure for operation of a cathode ray tube whereby a single sweep has a first pass across the full face of the tube, and then jumps down and returns with a second pass across the full face in substantially parallel opposite relation to the first pass, which includes an optical system to translate such passes in a lined front to end relationship onto a light-sensitive film moved at a controlled speed relative to the optical system. In essence, the optical system incorporates a substantially right angular flat medium having the ability to change the direction of light rays positioned with the apex thereof aligned between the parallel passes with the angle of each side of the medium at about 45° angular relation to the face plate, with associated reflective surfaces to align the rays emitted from the medium in successive front to end relation and project such aligned relation onto the light-sensitive film.

3,564,129
NOISE LIMITING CIRCUIT USING SWITCHED FILTER

Peter William Blaxtan, Watton at Stone, England, assignor to The Rank Organisation Limited, London, England

Filed Dec. 8, 1967, Ser. No. 689,115
Claims priority, application Great Britain, Dec. 8, 1966, 55120/1966
Int. Cl. H03g *5/18;* **H04n** *5/08, 5/21*
U.S. Cl. 178—6 **11 Claims**

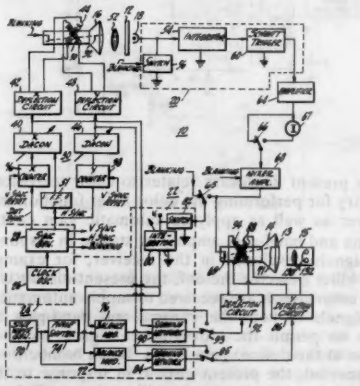


An electrical noise limiting circuit for use in an apparatus producing a composite signal including an information carrying signal of a selected bandwidth including a train of recurrent pulses. The circuit includes a switch responsive to the pulses in the composite signal, and a filter selectively connected to the apparatus by the switch. The filter reduces the level of the noise component in the composite signal at least during the periods of one or more of the pulses.

3,564,130
ELECTRONIC PHOTOCOPY SYSTEM

Horatio N. Crooks, and Raymond L. Hallows, Jr., Princeton, N.J., assignors to RCA Corporation, a corporation of Delaware

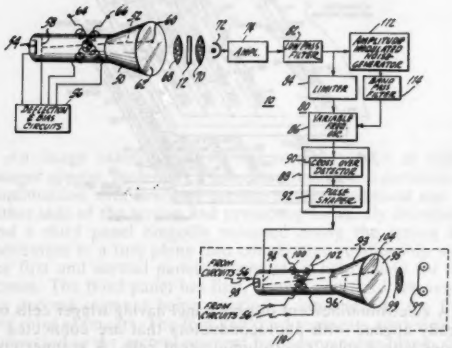
Filed Mar. 21, 1966, Ser. No. 535,883
Int. Cl. H04n *5/84*
U.S. Cl. 178—6.7 **12 Claims**



A photocopy system provides a halftone image of a picture composed of continuous tones by producing a plurality of

hollow halftone dots corresponding to the continuous tones. Each of the halftone dots comprises an annulus that has a size that corresponds to the density of a tone on the original picture.

3,564,131
SPATIALLY MODULATED HALFTONE DOT IMAGE GENERATION SYSTEM
Edward W. Herold and Kenneth H. Fischbeck, Princeton, N.J., assignors to RCA Corporation
Filed Dec. 22, 1967, Ser. No. 692,944
Claims priority, application Great Britain, Feb. 20, 1967, 8007/67
Int. Cl. H04n 5/84
U.S. Cl. 178—6.7 **3 Claims**



A halftone image generation system produces a replica of an original continuous tone pattern by utilizing halftone dots of substantially the same size. The continuous tones in the original pattern are duplicated in the halftone image thereof by varying the spacing between the halftone dots. The spaces between the halftone dots are, for example, small when a dense tone is duplicated, whereas the spacing is made larger when a less dense tone is duplicated.

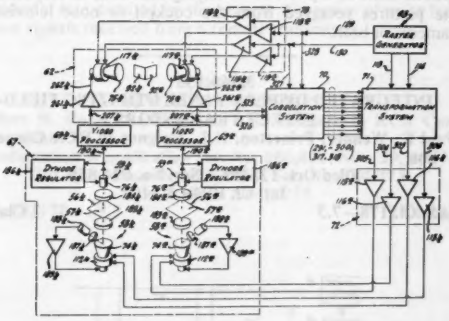
The halftone dot generator in the system may, for example, comprise an electronic imaging device that generates the halftone dots in the form of light radiation for focusing onto photographic film; or an optical device, such as a laser, that forms the halftone dots as indentations or cavities on a printing plate, or similar devices.

3,564,132
APPARATUS FOR CONTROLLING THE PASSAGE OF PERSONS AND OBJECTS BETWEEN TWO AREAS UTILIZING CLOSED CIRCUIT TELEVISION
Richard H. Baker, and Richard C. Hix, Los Altos, Calif., assignors to Mardix, Mountain View, Calif.
Filed Jan. 17, 1966, Ser. No. 523,499
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 **2 Claims**

A security system and method for controlling the passage of persons and objects between two areas employs scanning means for monitoring the contents of a control space having controlled access. Prior to admitting a person to this space, the contents are examined by the scanning means to determine the presence of any objects or persons therein. After a person is admitted to the space, access thereto is secured, such as by locking all doors thereto, and the scanning of the space continues to determine whether the admitted person has brought any unauthorized objects into the space with him. An identification procedure is then carried out for the admitted person, and if his identity is satisfactorily established, another one of the access doors is unlocked to allow the person to proceed. After departure of this person and prior to admitting another person to the space, the contents of the space are again monitored to insure that the person did not remain behind in the space, that he did not leave any unauthorized objects in the space and that he did not

admit another person to the space while he was obtaining ingress or egress.

3,564,133
TRANSFORMATION AND REGISTRATION OF PHOTOGRAPHIC IMAGES
Gilbert L. Hobrough, Woburn, Mass., assignor to Itek Corporation, Lexington, Mass.
Continuation-in-part of application Ser. No. 394502, Sept. 4, 1964, now Patent No. 3,422,674. This application Jan. 16, 1967, Ser. No. 609,662
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 **13 Claims**



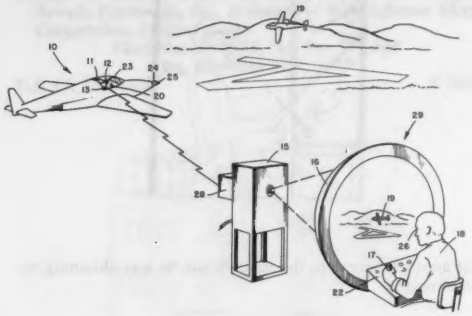
A method of and apparatus for developing from a stereographic pair of photographic images difficult of registration one with the other for optical inspection of homologous areas because of relative distortions therebetween, area-by-area reproductions of such photographic images suitably registered for optical inspection as a result of relative distortions being corrected. Involved in the system are scanning the photographic images area-by-area with a pair of flying spot scanners, collecting the image-modulated light produced by such scanning with a pair of photoelectric detectors, comparing the output signals from the photoelectric detectors in an electronic correlator and developing parallax error signals representative of relative distortions between the homologous areas being scanned, and providing at a binocular viewer optical reproductions of such areas correctively altered by an electronic transformation unit to relieve relative distortions and thereby provide optical images in registration for inspection. The relative distortions between photographic images are classifiable into zero-, first-second-, and higher-orders of distortion, and of primary concern herein is the correction of second- and higher-order distortions by means of reverberatory integration techniques.

3,564,134

TWO-CAMERA REMOTE DRONE CONTROL

Richard O. Rue and Vance L. Hansen, China Lake, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed July 3, 1968, Ser. No. 742,389
Int. Cl. H04n 5/22, 5/74
U.S. Cl. 178—6.8 7 Claims



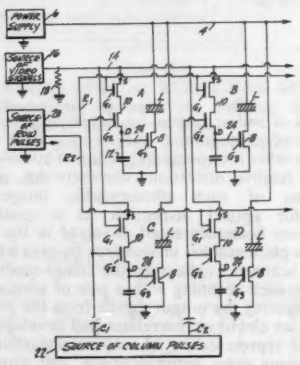
A system for flying a drone aircraft by remote control wherein a first television camera, with an ultrawide angle lens mounted thereon, is placed in the cockpit of the drone aircraft where the head of the pilot is normally located; a second television camera, with a zoom lens mounted thereon, is placed in the nose of the drone aircraft; means are provided to send the pictures from either camera back to the ground where they are projected, using rear projection means, onto a hemispherical viewing screen; and a remote ground control is provided for flying the drone in response to the pictures received from the cockpit or nose television cameras or both.

3,564,135

INTEGRATED DISPLAY PANEL UTILIZING FIELD-EFFECT TRANSISTORS

Paul K. Weimer, Princeton, N.J., assignor to RCA Corporation

Filed Oct. 12, 1967, Ser. No. 674,859
Int. Cl. H04n 3/14
U.S. Cl. 178—7.3 2 Claims



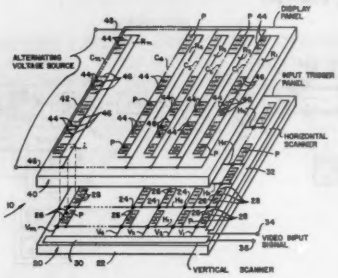
Elemental units are arranged in rows and columns. Each elemental unit has a light cell which is controlled by voltage developed across an associated storage capacitance that is connected to a source of video signals by a dual gate field effect transistor. Scanning is achieved by application of pulses of line and elemental duration to the gate electrodes of the transistors. The invention herein described was made in the course of or under a contract with the Department of the Air Force.

3,564,136

ELECTROLUMINESCENT TELEVISION DISPLAY PANEL

Alexander S. Gilmour, Jr., Williamsville, and Thomas L. Robinson, Sr., East Aurora, N.Y., assignors to Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y.

Filed June 10, 1968, Ser. No. 735,856
Int. Cl. H04n 5/44, 5/70
U.S. Cl. 178—7.3 9 Claims



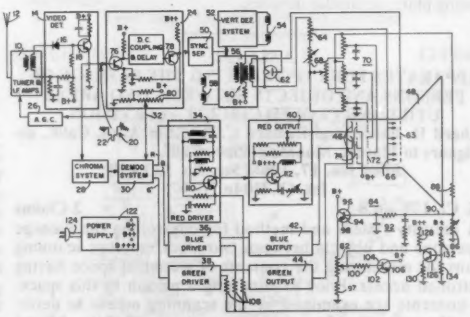
A electroluminescent display panel having trigger cells optically aligned with photoconductors that are connected in series with display electroluminescent cells. A scanner controls the application of a video signal to the trigger cells, which in turn actuate the display cells. Feedback can be provided to increase the decay time of the photoconductors.

3,564,137

AUTOMATIC BRIGHTNESS COMPENSATION CIRCUIT

Ernest C. MacIntyre, Jr., Villa Park, Ill., and William H. Slavik, Oak Lawn, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 26, 1968, Ser. No. 700,912
Int. Cl. H04n 5/16
U.S. Cl. 178—7.5 4 Claims

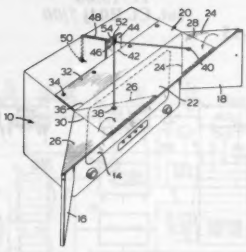


A video signal amplifier is direct current coupled to a cathode ray tube, and an amplifier device, which is sensitive to variations in supply voltage and environmental temperature, is coupled to the video amplifier to compensate conduction changes therein and maintain the brightness level of the image despite these variations. The compensation circuit may be part of a system limiting maximum brightness level of the image.

3,564,138
LIGHT SHIELD

William M. Harrold, Kitchener, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada

Filed Nov. 6, 1967, Ser. No. 680,839
Int. Cl. H01j 29/06
U.S. Cl. 178—7.9 8 Claims

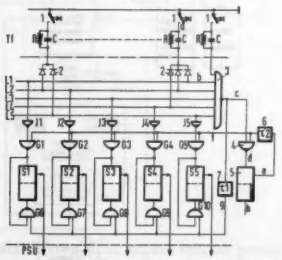


An image exhibiting member having a screen at which images appear, preferably a television receiver, is provided in combination with first and second panels positioned one at either side of the screen and projecting forwardly therefrom and a third panel hingedly mounted above the screen for movement in a first plane into cooperating relationship with the first and second panels to provide a light shield for the screen. The third panel has first, second and third segments, the second segment being positioned intermediate the first and third segments. The first and third segments are hingedly connected to the second segment for movement in planes different from the plane of movement of the second segment.

3,564,139
CIRCUIT ARRANGEMENT FOR PUSHBUTTON-CONTROLLED ELECTRONIC PARALLEL DELIVERY OF TELEGRAPHIC IMPULSES

Camillo Bodenstein and Herbert Strassner, Muenchen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Jan. 31, 1969, Ser. No. 795,669
Claims priority, application Switzerland, Feb. 2, 1968, 1.639/68
Int. Cl. H04l 13/08, 15/04
U.S. Cl. 178—17.5 5 Claims

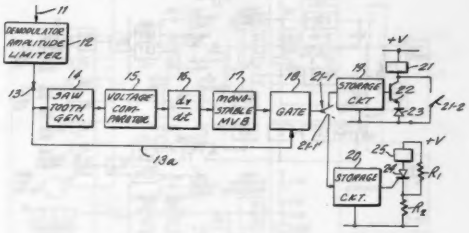


A circuit arrangement for the parallel transmission of key-selectable telegraph impulses in which, in response to the actuation of a key, at least one impulse having a duration greater than 2 microseconds is produced and supplied to a parallel storer having at least as many storage places as the possible number of impulses in the telegraph code field, in which control means, including an impulse shortening circuit, is operative to terminate and transfer the impulses to be stored into the storer after a period of less than 2 microseconds.

3,564,140
PHASE DETECTION AND SYNCHRONIZING SYSTEM FOR FACSIMILE AND THE LIKE

Kunio Tanaka, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed Oct. 2, 1967, Ser. No. 672,186
Claims priority, application Japan, Oct. 3, 1966, 41/64737
Int. Cl. H04n 1/36
U.S. Cl. 178—69.5 15 Claims

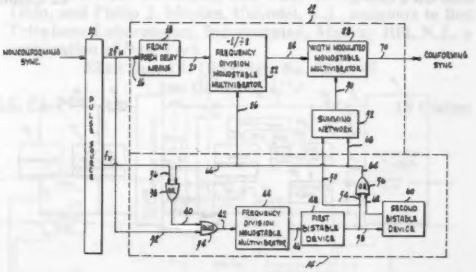


An automatic phase detection and synchronizing means for phototelegraphy, or facsimile systems and the like in which phase signals are conventionally transmitted as amplitude modulated carrier signals in advance of facsimile signals. In order to determine whether phase signals are being transmitted, the instant invention provides a device for determining the presence of phase signals by developing signals representative of the phase signals and comparing them with incoming phase signals which have not undergone detection, for the purpose of automatically synchronizing the operation of the revolving drum employed in facsimile systems with the rotational rate dictated by the receipt of a group of noise free phase signals received from a remote transmitter.

3,564,141
SYNC REGENERATOR

Robert N. Hurst, Haddonfield, N.J., assignor to RCA Corporation

Continuation of application Ser. No. 686,426, Nov. 29, 1967. This application Dec. 23, 1969, Ser. No. 884,773
Int. Cl. H04n 5/04, 5/78
U.S. Cl. 178—69.5 12 Claims

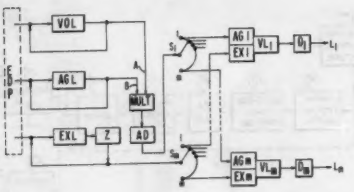


A sync regenerator for totally reproducing the television sync signal for a broadcast that has been recorded on video tape, where the reproduced sync signal is generated by the application of a single chain of pulses to a series of monostable multivibrators which are responsive to pulses generated by a logic circuit. This sync regenerator may also be arranged so that any selected one of the sync signals of the various international television standards may be reproduced by simply changing a few switch settings.

3,564,142
METHOD OF MULTIPLEX SPEECH SYNTHESIS

Ernst H. Rothauser, Wollerau, Switzerland, and Kurt F. Bandat, Beacon, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 30, 1968, Ser. No. 748,745
Claims priority, application Austria, Aug. 3, 1967, A7231
Int. Cl. H04b 1/66
U.S. Cl. 179—1 2 Claims

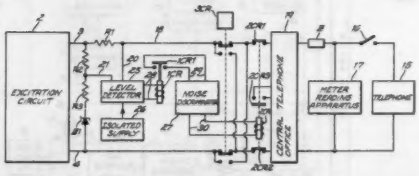


The invention relates to a method of channel vocoder speech synthesis. For representing the speech signals for several independent speech lines, digital speech data stored in data processors are used. In addition, the method provides for the storage of the time-sampled digital description of the transient behaviors of *n* spectrum channel band-pass filters. Only one such description is needed for synthesizing the speech signals for *m* speech lines. For a given speech line the transient responses of the band-pass filters are modulated by the frequency function for the given line. The modulated transient values are added for corresponding time samples and stored in a delay line for the given speech line. The stored value of a speech line is released at points in time defined by the excitation function, thus releasing a digital description of the transient response of the set of band-pass filters as if they were excited by a unit pulse and modulated by the frequency function of the given speech line. The digital description is demodulated to an analogue form by conventional means.

3,564,143
MEANS FOR PROVIDING FOR YIELDING TO A HIGHER PRIORITY SERVICE IN A TELEPHONE SYSTEM

Victor E. Stewart, Jr., South Milwaukee, Wis., assignor to McGraw-Edison Company, Milwaukee, Wis.

Filed June 5, 1968, Ser. No. 734,662
Int. Cl. H04m 11/08
U.S. Cl. 179—2 12 Claims

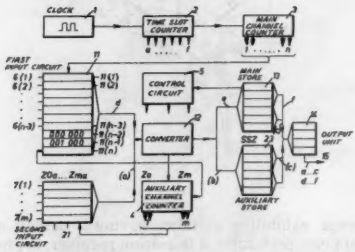


A system including an impedance limit detector for detecting, at a central location, the resistance or impedance level of a test circuit such as remotely located elements of a telephone system. In particular, the device detects whether or not a telephone is "on hook" or "off hook." The detector compares the current flowing in a reference circuit with a current flowing in the test circuit and is effective over a wide range of circuit voltages. The system further includes means for removing auxiliary apparatus from the line when the telephone is "off hook."

3,564,144
METHOD AND APPARATUS FOR TIME MULTIPLEX TRANSMISSION OF ELECTRICAL DIGITAL SIGNALS COMPRISING A PLURALITY OF TRANSMISSION CHANNELS

Hans Diggelmann, Muri, Bern, and Rudolf Kuehne, Berne, Switzerland, assignors to Hasler A. G., Berne, Switzerland

Filed Aug. 14, 1967, Ser. No. 660,392
Claims priority, application Switzerland, Aug. 15, 1966, 11715/66
Int. Cl. H04j 5/00
U.S. Cl. 179—15 9 Claims

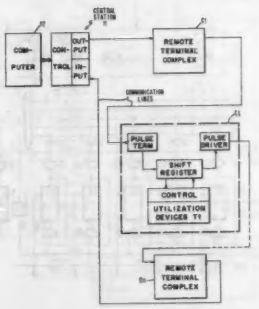


This invention relates to a method and means for transmitting electrical signals comprising a plurality of transmission channels in digital form over a transmission line wherein the transmission time is divided into frame periods of equal length. The frame periods are further subdivided into channel periods which are assigned to selected transmission channels. The invention contemplates the transmission through the main channels and through auxiliary channels to which no channel periods are assigned.

3,564,145
SERIAL LOOP DATA TRANSMISSION SYSTEM FAULT LOCATOR

Herman Deutsch, Raleigh, Delbert M. Knepper, Sr., Durham, and Walter D. Van Gieson, Jr., and Arthur Warner, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1969, Ser. No. 820,406
Int. Cl. H04j 3/14
U.S. Cl. 179—15 6 Claims



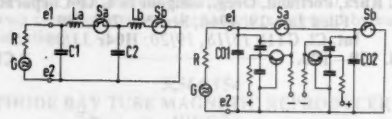
Terminals in a serial loop data transmission system automatically monitor input data to detect no data and mutilated data conditions. When either condition is detected, signals including the unique terminal address are automatically generated. The generated signals satisfy all down stream terminals and the central controller within a predetermined time is provided with the address of the terminal immediately following the fault and an indication of the type of fault.

3,564,146

FREQUENCY FILTER CONTROLLED BY PULSE TRAINS

Werner F. Poschenrieder, Max Schlichte, and Allan Darre, Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Germany

Filed Dec. 12, 1966, Ser. No. 600,904
Claims priority, application Germany, Dec. 14, 1965, S100956
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 22 Claims



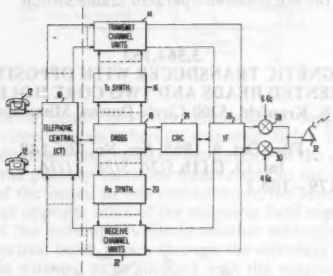
An improved frequency filter responsive to control pulses which determine the characteristic frequency thereof. Switches operated by the control pulses complete circuits for effecting pulse-type energy exchanges in associated storage capacitors. Special circuit provisions substantially eliminate energy losses in the filter.

3,564,147

LOCAL ROUTING CHANNEL SHARING SYSTEM AND METHOD FOR COMMUNICATIONS VIA A SATELLITE RELAY

John G. Puente and Richard B. McClure, Rockville, Md., George D. Dill, Vienna, Va., Eugene R. Cacciamani, Washington, D.C., Andrew M. Walker, Alexandria, Va., and William G. Schmidt, Rockville, Md., assignors to Communications Satellite Corporation

Filed Apr. 5, 1968, Ser. No. 719,138
Int. Cl. H04j *1/14*
U.S. Cl. 179—15 17 Claims



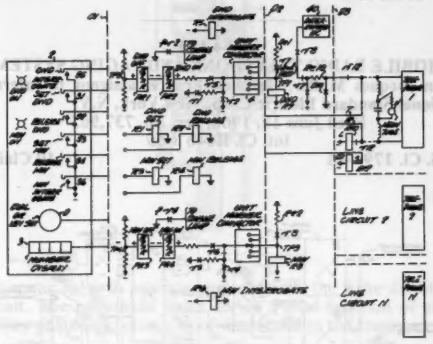
A demand assigned multiple access system provides for the sharing of satellite circuits by a large number of terrestrial users. Demand assignment of satellite circuits is especially useful and efficient to the developing nations as compared to preassignment of satellite circuits, since they have a low number of call minutes per day. Terrestrial transmissions are FDM multiplexed through the satellite on a single channel or carrier, and since no carriers are preassigned between specific terrestrial locations, any ground station may select any one of the carriers available in the entire system, provided that carrier is not presently in use. A common TDM channel is used at all terrestrial locations for maintaining a record of the carriers used and requested by all locations.

3,564,148

SWITCHING SYSTEM PROVIDING MESSAGE-WAITING AND DO-NOT-DISTURB SIGNALS ON PBX TELEPHONE EXTENSIONS

Otha C. Lee, Milan, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y., a corporation of Delaware

Filed Aug. 19, 1968, Ser. No. 753,614
Int. Cl. H04q *3/49*
U.S. Cl. 179—18 10 Claims



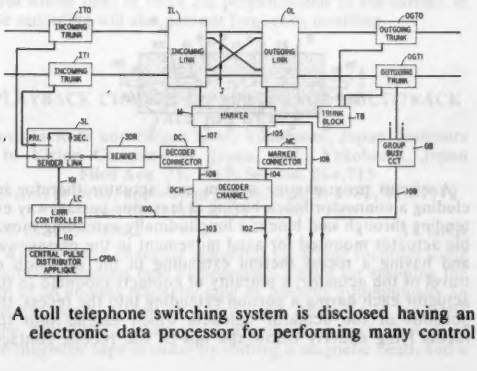
An automatic switching system is equipped to enable manual control of visual indicators at individual telephone extensions of a private branch telephone exchange. The system makes it possible for a switchboard operator to close switches to operate visual indicators at selected individual subscriber sets and thus to indicate that a message is waiting. The system makes it possible for the operator to set a do-not-disturb circuit in response to a request from a subscriber and to signal the subscriber that the request has been honored. The system also makes it possible for connections to be completed to and from the subscriber stations when the message waiting indicator is on. The system returns a busy signal when the do-not-disturb indicator is on. The system operates to restore indicator signals when such connections are terminated. The subscriber station is allowed to originate calls in the do-not-disturb condition but incoming calls are not allowed to ring the station in this condition. The operator has the option to override the do-not-disturb condition in an emergency without changing the state of said circuit.

3,564,149

TOLL TELEPHONE SYSTEM HAVING AN ELECTRONIC DATA PROCESSOR

Charles J. Funk, Columbus, and Paul R. Miller, Gahanna, Ohio, and Philip J. Moylan, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

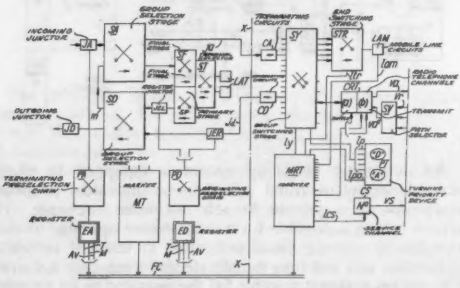
Filed Dec. 18, 1968, Ser. No. 784,615
Int. Cl. H04q *3/54*
U.S. Cl. 179—18 18 Claims



A toll telephone switching system is disclosed having an electronic data processor for performing many control

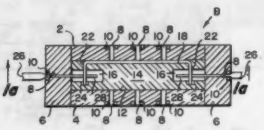
functions including route translation. The electronic data processor cooperates with other units of control equipment, e.g., markers, to translate digital information received over incoming trunks into directive information which is used in processing calls. The processor can pretest certain outgoing trunk routes before distributing directive information to the markers that select and establish connections to idle outgoing trunks. The processor keeps an inventory of what information was distributed for each call and monitors marker disposition of the call.

3,564,150
MOBILE RADIO TELEPHONE AND PAGING SYSTEM
Jean Jacques Muller, Garches, France, assignor to International Standard Electric Corp., New York, N.Y.
Filed June 18, 1968, Ser. No. 737,963
Int. Cl. H04b *3/60*
U.S. Cl. 179—41 **10 Claims**



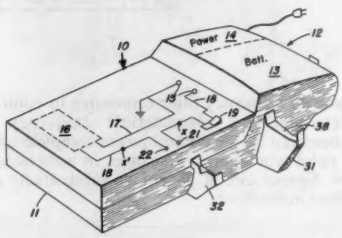
A public mobile radio communication system is provided for a plurality of mobile radio stations in which each mobile station includes either paging devices, or a telephone, or both. The system employs a service radio channel for sending selective calls from a fixed station to terminate at all the mobile stations. A second radio channel is marked by the fixed station for signaling from the mobile stations having telephones and the capacity to originate calls. Communication between the fixed station and a mobile telephone will employ either the second marked channel or another differently marked free channel.

3,564,151
CIRCUIT PROGRAMMING SYSTEM-BELT TYPE SWITCH WITH DEFLECTABLE SPRING CONTACT MEANS
Bernard Edward Shlesinger, Jr., 3906 Bruce Lane, Annandale, Va. 22003
Filed June 30, 1969, Ser. No. 837,466
Int. Cl. H01h *15/00, 43/08*
U.S. Cl. 200—46 **36 Claims**



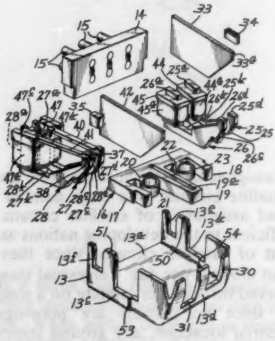
A circuit programming system and actuator therefor including a connector block having at least one passageway extending through said block; a longitudinally extending movable actuator mounted for axial movement in the passageway and having a recess therein extending in the direction of travel of the actuator; a plurality of contacts mounted in the actuator each having a portion extending into the recess; the portions of the actuator contacts which extend into the recess lying entirely below the lips of the recess; contacts mounted in the block and projecting into the passageway and into the recess for engagement with the portions of the actuator contacts; and the contacts including spring deflecting means for permitting the actuator contacts and the block contacts to pass each other; whereby when the actuator is moved in the passageway, the actuator contacts engage the block contacts thereby to operate a circuit in a programmed period as determined by the length and spacing of the contacts and the rate of travel of the actuator.

3,564,152
DICTATING MACHINE WITH MICROPHONE OPERATED CRADLE SWITCH
Karl F. Kurz, Portland, Oreg., assignor to GAF Corporation
Filed Jan. 29, 1968, Ser. No. 701,180
Int. Cl. G11b *15/18, 19/20;* **H04r** *33/06*
U.S. Cl. 179—100.1 **2 Claims**



The invention relates to a combined dictation machine and detachable microphone cradle. The bottom of the dictation machine has a pair of sockets, one being electrically connected to the power circuit and the other being closed by a leaf switch element completing the circuit. The microphone cradle includes a pair of projecting pins connected to a microphone-operated normally closed switch. Upon insertion of the pins of the microphone cradle into the sockets of the dictation machine the leaf switch breaks the power circuit within the dictation machine and completes the circuit through the normally closed switch in the cradle so that control over the power circuit of the dictation machine is transferred to the microphone-operated cradle switch.

3,564,153
MAGNETIC TRANSDUCER WITH OPPOSITELY ORIENTED HEADS AND TWO CORE HOLDERS
Leonard E. Kronfeld, 5200 Circle Downs, Minneapolis, Minn. 55416
Filed Oct. 9, 1968, Ser. No. 766,148
Int. Cl. G11b *5/26, 5/28, 21/16*
U.S. Cl. 179—100.2 **15 Claims**



A magnetic transducer having two oppositely oriented, spaced stereo heads, each head having a pair of magnetic cir-

cuits capable of alternatively erasing and recording or playing back signals on a magnetic tape. Each circuit includes a pair of oppositely disposed generally U-shaped core pieces and a common center leg core piece. Erase and recording gaps are provided for each circuit between the core tips of the U-shaped core pieces and the top portion of the center leg core piece. The four recording gaps for the transducer all lie in a single plane extending transversely through both heads. The center leg core piece for one stereo head thus lie on one side of the plane while the center leg core pieces for the other stereo head lie on the other side of the plane. The transducer is split along the plane with all structure on one side thereof mounted in a first core holder and all structure on the other side thereof mounted in a second core holder. The two core holders and the structures carried by each are thus identical.

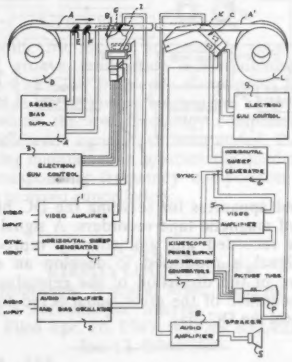
3,564,154
CATHODE RAY TUBE MAGNETIC REPRODUCER FOR VIDEO

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Original application Aug. 10, 1959, Ser. No. 832,848, now Patent No. 3,133,150, dated May 12, 1964, which is a division of Ser. No. 281,939, dated Apr. 11, 1952, now Patent No. 2,900,443, dated Aug. 18, 1959. Divided and this application Mar. 9, 1964, Ser. No. 350,514

Int. Cl. G11b *5/32;* **H04n** *1/24;* **H01j** *31/04*

U.S. Cl. 179—100.2 **23 Claims**



An electron beam head for reproducing magnetically recorded video signals wherein magnetic fields from the record medium are channeled to the interior of the envelope to deflect the primary electrons transversely to the scanning direction of the beam. In one embodiment, the sensing electrodes are at opposite sides of the magnetic field region at an end wall of the envelope, while in another embodiment the primary electron beam passes through the openings in a grid of magnetic wires so as to interact with the magnetic fields therebetween, electrostatic deflecting means serving to deflect the electron beam through a substantial angle as it leaves the grid so as to impinge on sensing electrodes remote from the grid. In a third embodiment, secondary electrons are conducted into a branch tube extending from the main envelope and a single electrode senses the degree of deflection of the secondary electrons by the magnetic fields permeating the secondary emission region.

3,564,155
PNEUMATICALLY OPERATED WRITE LOCKOUT MEANS FOR MAGNETIC RECORDER

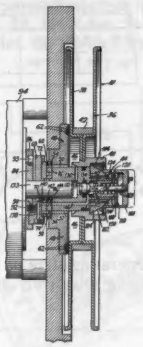
Robert A. Pendleton, Dedham, Mass., assignor to Honeywell Inc.

Original application Mar. 10, 1960, Ser. No. 14,091, now Patent No. 3,145,944, dated Aug. 25, 1964. Divided and this application Mar. 9, 1964, Ser. No. 354,814

Int. Cl. G11b *15/04*

U.S. Cl. 179—100.2 **10 Claims**

Write lockout protection for a magnetic record is provided by having a lockout device removably carried with the record so as to engage, when the record is operatively installed on the recording transport, an actuating element that operates a



pneumatic valve to activate pneumatically the write disabling circuit. The pneumatic valve serves a dual function of controlling pneumatic clamping of the record to the transport.

3,564,156
PROCESS FOR THE PRODUCTION OF MAGNETIC TAPES WHICH CANNOT BE ERASED

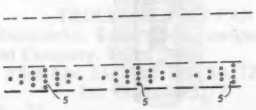
Joachim Greiner, Wolfgang Eichler, Wilhelm Abeck, Leverkusen, and Erich Muller, Bergisch-Neukrichen, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 20, 1967, Ser. No. 654,877

Claims priority, application Germany, July 29, 1966, A53128

Int. Cl. G11b *5/86*

U.S. Cl. 179—100.2 **6 Claims**



Noneraseable copy of a magnetic recording is made by applying to the recording movable magnetizable particles to cause them to be attracted by and arranged in accordance with the stray fields of the recording, then fixing the particles in position with respect to each other, securing the fixed particles to a separate backing and removing the backing with the particles therein from the recording. When the particles are applied a magnetic field can also be impressed to render the magnetizing of the magnetizable particles more ideal, or the particles can be magnetized by cooling down from their Curie point. The application of a unidirectional magnetic field whose lines of force are perpendicular to the surface of the recording will also prevent frequency doubling.

3,564,157
PLAYBACK CHANGE APPARATUS FOR MULTITRACK TAPE RECORDER

Yoshiro Kato and Shigeo Kato, Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 31, 1967, Ser. No. 664,713

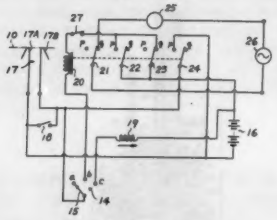
Claims priority, application Japan, Sept. 1, 1966, 41/81972

Int. Cl. G11b *15/06, 15/10, 71/08*

U.S. Cl. 179—100.2 **3 Claims**

An operation changing apparatus for a tape recorder using multitrack endless tape comprising a circuit for stopping the run of an endless magnetic tape by opening automatically an electric power circuit of a motor for driving said magnetic tape, a circuit for changing and performing each channel of the magnetic tape in order by shifting a magnetic head, and a

circuit for driving said motor successively by opening said automatic stopping circuit and said automatic channel changing

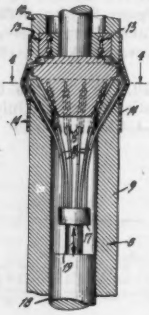


circuit, wherein any operating state of the tape recorder can be obtained by changing selectively and suitably each said circuit.

3,564,158
TAPE LIFTER

Charles R. Horton, Beverly, N.J., assignor to RCA Corporation

Filed June 24, 1968, Ser. No. 739,371
Int. Cl. G11b *5/00*
U.S. Cl. 179—100.2 **8 Claims**



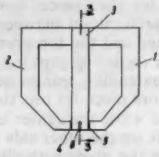
A technique is disclosed for separating a web from its supporting member without movement of the supporting member. A number of web-engaging rods are disposed within the supporting member close to the supporting surface traversed by the web. When actuated, the rods protrude from the supporting surface and are interposed between the web and its supporting surface. This causes the web to be lifted or separated from the supporting surface. The amount of separation and its extent along the supporting surface may be determined by the orientation and amount of movement of the web-engaging rods.

3,564,159
MAGNETIC HEAD FOR USE WITH GROOVE-TYPE RECORDING CARRIERS

Berthold Kussner, Berlin, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.h., Ulm, Danube, Germany

Filed Sept. 3, 1968, Ser. No. 756,968
Claims priority, application Germany, Sept. 2, 1967, P 15 72 527.6
Int. Cl. G11b *5/26, 21/06*
U.S. Cl. 179—100.2 **7 Claims**

A magnetic head for use with a recording device of the type employing a grooved recording carrier and arranged to experience reduced wear by being provided, at its lower end which contacts the recording carrier groove, with a contact element made of a hard material and disposed in a blind hole formed in the lower end of the head, the lower end of the head being formed so as to be flush with the exposed end of

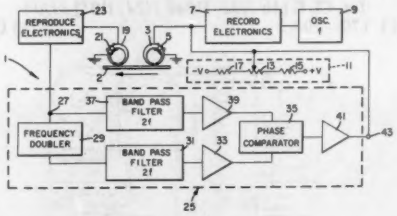


the contact element and so as to have a width which is approximately equal to the diameter of the contact element.

3,564,160
DC BIAS SERVOMETHOD AND APPARATUS FOR MAGNETIC RECORDING HEADS

Gabor C. Temes, Los Altos, and Peter Bajka, Redwood City, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Oct. 11, 1968, Ser. No. 766,749
Int. Cl. G11b *5/02, 5/44*
U.S. Cl. 179—100.2 **10 Claims**

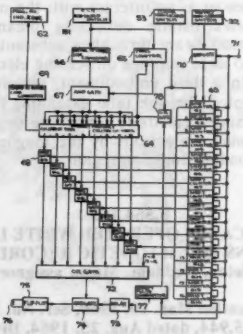


Method and apparatus for servoing the DC bias on magnetic heads of magnetic tape recorders. A signal of selected frequency is recorded and immediately reproduced. The reproduce signal is processed to develop an error signal representative of the distortion of the reproduce signal. A signal representative of the error signal is fed to the record head to control the DC bias.

3,564,161
CUE SIGNAL RECORDING AND REPRODUCING SYSTEM FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS

Hidenori Takishima, Sagamihara, Japan, assignor to Victor Company of Japan Limited, Yokohama, Japan

Filed Dec. 11, 1968, Ser. No. 782,806
Claims priority, application Japan, Dec. 14, 1967, 42/79763
Int. Cl. H04n *5/78;* **G11b** *15/20*
U.S. Cl. 179—100.2 **6 Claims**



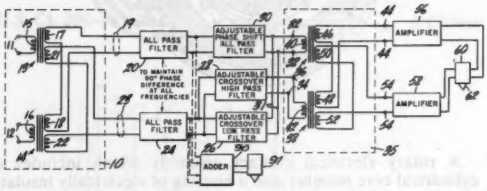
This is a cue signal system for a video magnetic recording and reproducing apparatus. The cue signals are in the form

of digital codes or pulses synchronized with control signal pulses used for servo control. These pulses are coded to indicate the contents of the cue signals. The cue signals reproduced from the tape are compared with control signal pulses to detect the accurate contents of the reproduced cue signals irrespective of the rate of travel of the magnetic medium.

3,564,162
STEREOPHONIC RECORDING SYSTEMS WITH QUADRATURE PHASE RELATION

Benjamin B. Bauer, Stamford, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Feb. 2, 1968, Ser. No. 702,723
Int. Cl. G11b *3/00;* **H03f** *13/00*
U.S. Cl. 179—100.4 **14 Claims**

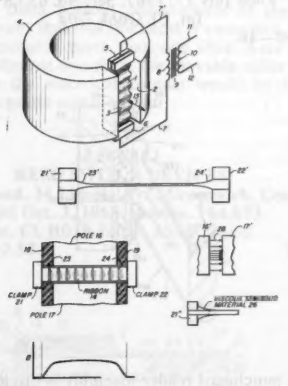


Stereophonic disc records are made by recording as vertical record groove modulation a stereophonic difference signal from which low frequency components have been extracted, and as lateral groove modulation a stereophonic sum signal to which the low frequency components extracted from the difference signal have been added, the latter components being maintained in substantially quadrature relation to the corresponding frequency components of the sum signal so as to avoid cancellation.

3,564,163
RIBBON LOUDSPEAKER

Gilbert L. Hobrough, Woburn, Mass., assignor to Robert L. Wathams, a fractional part interest

Filed Apr. 20, 1967, Ser. No. 632,422
Int. Cl. H04r *9/00*
U.S. Cl. 179—115 **16 Claims**



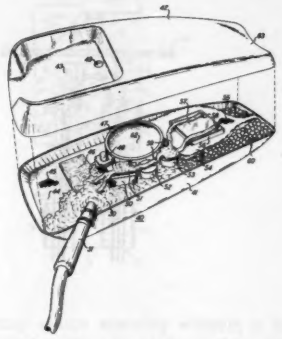
This disclosure describes a ribbon-type loudspeaker having a ribbon carrying voice currents and being positioned between magnetic poles.

Various means to attenuate or eliminate standing waves on the ribbon are shown.

3,564,164
METHOD FOR CONSTRUCTING TELEPHONE STATIONS USING FLOWABLE, ADHESIVE HARDENING MATERIAL; AND INSTRUMENTS SO BUILT

Robert E. Prescott, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 25, 1968, Ser. No. 700,521
Int. Cl. H04m *1/02*
U.S. Cl. 179—178 **3 Claims**

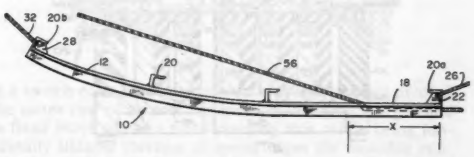


The packaging of a telephone handset or base is simplified and assembly costs reduced by using a flowable adhesive hardening substance as an interior fill. The substance, such as polyurethane foam, retains all components in desired position, firmly bonds the mating shells together so that no other fastening is needed, and with the plastic shells forms a composite structure providing the required strength, rigidity, and protection against tampering and mechanical shock.

3,564,165
TROLLEY ENTRY PAN

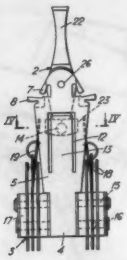
Henry C. Doennecke, Tulsa, Okla., assignor to Unit Rig & Equipment Company, Tulsa, Okla.

Filed Apr. 15, 1968, Ser. No. 721,498
Int. Cl. B60m *1/12*
U.S. Cl. 191—35 **2 Claims**



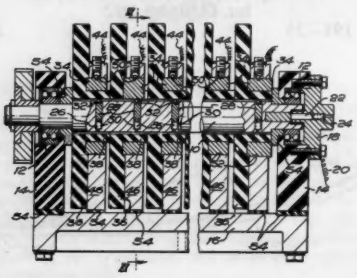
A trolley entry pan for automatically guiding the trolley poles of an electric powered vehicle, and particularly an electric powered rubber tired off-highway vehicle, into proper alignment with the trolley wires from which the vehicle receives electric power. The entry pan comprises a pair of substantially funnel-shaped channel members disposed in side-by-side relation for receiving a trolley pole in the open larger end of each channel and guiding the respective pole directly onto or into engagement with the respective trolley wire. The trolley poles are brought into engagement with the entry pan device as the vehicle moves in a direction toward the trolley wires. Thus, the pan automatically positions the trolley poles on the respective trolley wire in a manner eliminating manual handling of the poles at the initial stage of the engagement with the trolley wire.

3,564,166
ELECTRICAL LEVER ACTUATED KEY SWITCH WITH IMPROVED CAM POSITIONING MEANS
John Anthony Cartwright, Northampton, England, assignor to Painton & Co. Ltd., Northampton, England
Filed Apr. 22, 1969, Ser. No. 818,351
Claims priority, application Great Britain, Apr. 24, 1968, 19502/68
Int. Cl. H01h 9/00
U.S. Cl. 200—1 14 Claims



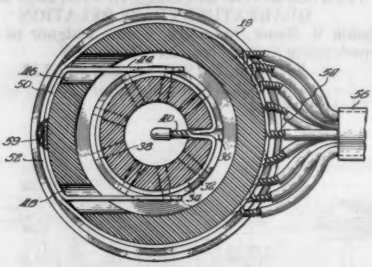
A versatile electrical key switch and components for forming the same, comprising a switch body supporting pivotally a switch lever, the lever carrying cam means of any desired shape which are engaged by a resilient member carried by the body and which biases the lever to at least one stable position, this position being dependent upon the cam configuration of the cam means.

3,564,167
SEQUENCE CONTROLLING APPARATUS
Frederick W. Armytage, Foundry Lane, Knottingley, Yorkshire, England
Filed Mar. 27, 1969, Ser. No. 811,034
Claims priority, application Great Britain, Nov. 9, 1968, 53,183/68
Int. Cl. H01h 19/56, 21/76
U.S. Cl. 200—8 7 Claims



In a sequence controller supplying electrical signals in a sequence which can be adjusted, a mechanism comprising: a rotatable electrical conductor shaft connected to an electrical power source; a plurality of individually rotatable handwheels in side-by-side relation on said shaft; a conductor element secured to each handwheel from which a signal is supplied; an electrical signal distributor, associated with and contacting each conductor element, which is carried by said shaft to make contact with the associated conductor element one time for each revolution or partial revolution of the shaft; and friction holding means associated with the handwheels for holding one or more of them in a predetermined angular position.

3,564,168
ROTARY ELECTRICAL CONTACT ASSEMBLY WITH IMPROVED CONTACT COLLECTOR RETAINING MEANS
Kenly C. Bigg, Fort Wayne, Ind., assignor to Kendick Manufacturing Company, Fort Wayne, Ind.
Filed June 2, 1969, Ser. No. 829,526
Int. Cl. H01r 39/20
U.S. Cl. 208—8 8 Claims

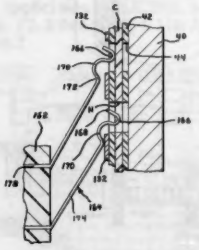


A rotary electrical contact assembly which includes a cylindrical core member and a housing of electrically insulating material disposed in concentric, rotatable relation to each other, an elongated electrical conductor terminating in a lead wire, which conductor is supported by at least a segment of said core member, and a brush member supported by and extending through an opening in the housing, the conductor and brush member being disposed in coplanar, annular recesses in their respective supporting members, with the brush member being held in place therein by an overlying second conductor which also terminates in a lead wire.

ERRATUM

For Class 200—46 see:
Patent No. 3,564,151

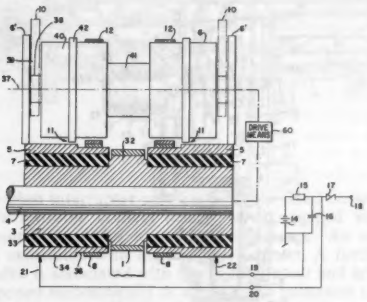
3,564,169
STATIC PUNCH CARD READER
Gilbert Carl Sitz, Harrisburg, Pa., and Bruce Richard McFadden, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed July 17, 1967, Ser. No. 653,892
Int. Cl. G06k 7/04
U.S. Cl. 200—46 13 Claims



A static punchcard reader assembly is disclosed having an array of contact spring members, one for each possible bit position and hole in a data card. An interposed plate is provided to receive the ends of the spring members and to prevent fouling thereof on a card. The assembly includes a mechanism for effecting relative movement between contact spring members and conductive pads disposed in planar array on the interposed plate or, alternatively, on a sheet engaged by portions of the contact members made to project through

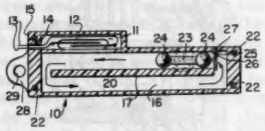
card holes. Embodiments are disclosed featuring an assembly effecting contact closure with constant spring deflection in a manner insensitive to card dimensions and particularly card thickness, and an adjustment is provided in one embodiment for causing the contact members to engage fresh surfaces on conductive pads to extend the life of the assembly relative to contact wear. An embodiment is disclosed which features a wiping action under low force loads also to increase wipe.

3,564,170
MULTIPLE SHEET REMOVAL DETECTOR EMPLOYING ELECTRICALLY CONTACTING ROLLERS
Karl Rehm, and Hermann Schwarz, Constance, Germany, assignors to Licentia Patent-Varwaltungs-G.m.b.H., Frankfurt Main, Germany, 0
Filed Apr. 24, 1969, Ser. No. 819,036
Claims priority, application Germany, Mar. 22, 1969, P1,914,823
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.41 **5 Claims**



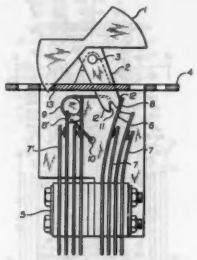
Apparatus for testing sheets to determine if a given thickness has been exceeded includes a fixed roller having a generally cylindrical surface including a sheet-carrying portion and an electrical contact portion, and a movable roller having a similar sheet-carrying portion and an electrical contact portion. The diameters of the electrical contact portions and the sheet-carrying portions are such that in normal operation the electrical contact portions of the two rollers are in contact with each other while the two sheet-carrying portions are spaced by a distance which permits passage of a sheet between them without displacement of the movable roller. In the event that this thickness is exceeded, as for example, would occur if more than one sheet were delivered between the rollers at one time, the movable roller would be moved so that the electrical contact would be broken to trigger an appropriate signal circuit.

3,564,171
REED SWITCH DEVICES
John S. Hammond, 34 Lincoln Ave., Greenwich, Conn. 06830
Filed Oct. 3, 1968, Ser. No. 764,673
Int. Cl. H01h *35/02, 36/00, 36/02*
U.S. Cl. 200—61.52 **10 Claims**



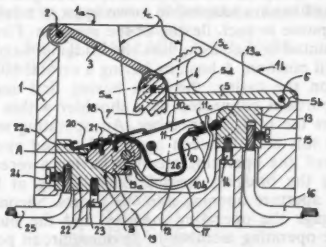
The invention relates to a reed switch device wherein a bar magnet is mounted in such a way that the on-off switch differential is minimized. The device may be used to respond to changes in speed, pressure, temperature, or inclination.

3,564,172
ROCKER ARM SWITCH
Alfred Laakso, Bayside Hills, N.Y., assignor to Executone Inc.
Filed Dec. 30, 1968, Ser. No. 787,446
Int. Cl. H01h *13/26*
U.S. Cl. 200—67 **1 Claim**



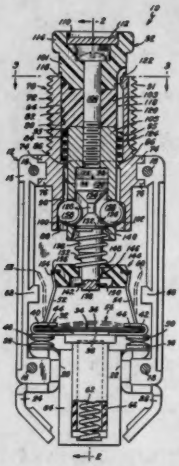
An improved pileup switch assembly wherein a hairpin spring maintains a pileup position for each switch position.

3,564,173
SWITCHING APPARATUS
Marcel Duzea, 125 Rue Garibaldi, 69 Lyon, Geme, France
Filed July 23, 1969, Ser. No. 843,960
Claims priority, application France, Aug. 5, 1968, 50,275
Int. Cl. H01h *21/44*
U.S. Cl. 200—73 **9 Claims**



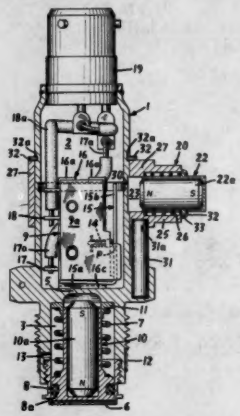
In a switch each pole comprises a movable contact pivoted at the outer end of an arm the inner end of which is pivoted on a fixed block about a fixed pivoting axis, while being longitudinally slidable thereon. A spring urges the movable contact both angularly in the same direction as the direction of the opening angular movement of the arm about is pivoting axis, and radially and outwardly with respect to said axis, angular rotation of the movable contact with respect to the arm under the action of the spring being limited by an abutment. During the closing movement of the arm, cam surfaces act on the arm actuating member to push the said arm inwardly with respect to its pivoting axis against the spring. At the end of this movement the cam surfaces liberate the arm actuating member and the movable contact is thus suddenly applied by the spring against a fixed contact. During the subsequent opening movement of the arm, the cam surfaces are rendered ineffective and the movable contact is momentarily retained by the fixed contact owing to the conformation of the contacting surfaces. It is thus compelled to rotate against the action of the spring until it is fully disengaged from the fixed contact. The movable contact may be equipped with an auxiliary arc rupturing contact which forms a fulcrum for the rotation of the movable contact.

3,564,174
CIRCUIT BREAKER
David E. Clarke, Bristol, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 6, 1969, Ser. No. 847,854
Int. Cl. H01h 15/18
U.S. Cl. 200—77 4 Claims



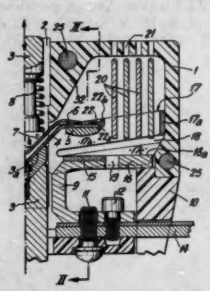
A circuit breaker comprises a casing, a pair of contacts mounted on the casing, and a member movable between a position bridging said contacts for closing a circuit and a position opening said circuit. The bridging member is adapted to flex to a selected extent in response to a selected current in the circuit and a pair of upstanding arms on the bridging member are adapted to move apart to a selected extent in response to such flexing of the member. First biasing means mounted in the casing bias the bridging member to its open circuit position. A bushing having a central bore is then mounted on the casing, the bore having first and second diameter portions connected by a shoulder within the bore which faces the bridging member. An operating member is slidable in this bore between open and closed circuit positions thereof, the operating member having a recess at one end facing the bridging member and having at least one peripheral aperture opening into the recess. Second biasing means engage the operating member and the bushing for biasing the operating member to its open circuit position. A first latching member has a cam portion slidable in the operating member recess and has a shank portion extending from the recess. A second latching member is slidably mounted on this shank portion of the first latching member; a latching ball is disposed within the aperture opening into the operating member recess and engages the cam portion of the first latching member therein; and a third biasing means engaging the first and second latching members biases the cam portion of the first latching member away from the second latching member. The second latching member normally engages the arms of the bridging member for holding the bridging member in its closed circuit position and for biasing the cam portion of the first latching member to cam the latching ball through the operating member aperture into engagement with the shoulder in the bushing bore to releasably hold the operating member in its closed circuit position. However, the second latching member is adapted to be released from its engagement with the bridging member arms in response to said movement of the arms, thereby to release the cammed engagement of the latching ball with the shoulder within the bushing bore and to permit the operating member and the bridging member to move their open circuit positions in response to said biasing means. Manual force moving the operating member toward its open circuit position also serves to apply a force to the latching ball engaged by the bushing shoulder for camming the cam portion of the first latching member toward the second latching member against the bias of the third biasing means, thereby to permit the latching ball to disengage the bushing shoulder and to permit the operating member and the bridging member to move to their open circuit positions in response to the first and second biasing means.

3,564,175
MAGNETIC DIFFERENTIAL PRESSURE-RESPONSIVE MEANS
Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.
Filed Apr. 1, 1969, Ser. No. 812,166
Int. Cl. H01h 35/38
U.S. Cl. 200—82 25 Claims



A magnetic pressure-responsive switch is provided, having a magnetic piston that is movable toward and away from a partition in a housing in response to a predetermined pressure differential between two passages. An electrical switch positioned on the other side of a partition from the piston has a pivoted generally L-shaped magnetic lever arm. When the magnetic piston moves into actuating position the lever arm is correspondingly moved into a second position to operate the switch.

3,564,176
MAGNETIC ELECTRIC ARCING EXTINCTION DEVICE
Louis J. M. Fechant, Chatou, Yvelines, France, assignor to La Telemecanique Electrique, Haute de Seine, France
Filed Aug. 23, 1968, Ser. No. 754,818
Claims priority, application France, Sept. 1, 1967, 119,683
Int. Cl. H01h 9/34
U.S. Cl. 200—144 10 Claims



An arc extinction device has a U-shaped magnetic member formed of flat strip folded about lines parallel to the width of

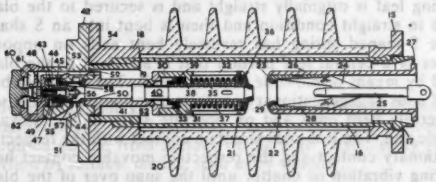
the strip, and each limb is slotted along its length to provide second limb portions reversely directed towards the base of the U without meeting the latter.

3,564,177

DUAL GAS-BLAST CIRCUIT INTERRUPTER IN WHICH ONE OF TWO EXHAUST VALVES OPERATES AUTOMATICALLY

John Robert Brit and Rudolph Valentini, Stafford, England, assignors to The English Electric Company Limited, London, England

Filed July 23, 1968, Ser. No. 746,901
Claims priority, application Great Britain, Aug. 18, 1967, 38289/67
Int. Cl. H01h *33/80*
U.S. Cl. 200—148 6 Claims



A gas-blast interrupter unit has a hollow fixed contact and a hollow movable contact which, when engaged with the fixed contact provides a continuous passage. An exhaust valve is associated with the movable contact. A further exhaust valve is associated with the fixed contact and arranged to be opened automatically as a result of a reduction of pressure which occurs in the continuous passage when the other exhaust valve is opened. Thus, when the contacts begin to open, pressurized gas blasts through both the fixed and movable contacts and through their respective exhaust valves. A delay chamber is operable to restore the further exhaust valve to its closed position automatically after a predetermined time interval sufficient for arc extinction to take place.

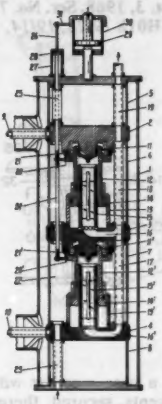
3,564,178

CIRCUIT-BREAKER WITH PRESSURE BALANCED RELATIVELY MOVABLE CONTACTS

Rintje Boersma, Harmelen, and Gijsbert W. Irik, Bilthoven, Netherlands, assignors to N.V. COQ, Utrecht

Filed Apr. 8, 1968, Ser. No. 719,339
Claims priority, application Netherlands, Apr. 13, 1967, 6705204
Int. Cl. H01h *33/80*
U.S. Cl. 200—148 9 Claims

A circuit-breaker is provided with relatively movable contacts and an actuating rod is attached to one of the contacts to effect separation of the contacts and opening of the circuit-breaker. The contact assembly is housed within an outer chamber which is subjected to insulating gas under high pressure and the contact assembly forms an inner chamber which, when the contacts are closed, is isolated from the outer chamber and which is vented to a pressure lower than the pressure in the outer chamber. A small net force acts on the movable contact to which the actuating rod is attached to maintain the contacts in closed condition. When the contacts are closed, the pressure differential existing between the outer and inner chambers is used in substantially balancing fashion and additional means is provided for cooperating with this differential pressure effect to establish the small net force serving to maintain the contacts in closed condition. When the contacts are open the pressure differential disappears and full pressure balance is effected so that both upon initial opening and continued opening movement as effected by the actuating rod, the actuating rod is subjected to very little mechanical stress. The opening of the contacts opens a valve formed between separable contacts and communicating the inner chamber with the outer chamber and allowing the insulating or extinguishing gas to rush past the contacts and



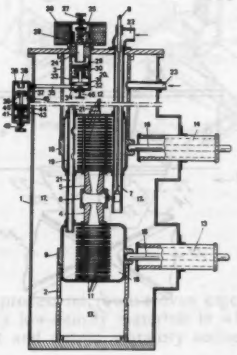
axially through at least one of them for extinguishing the arc produced by opening of the contacts.

3,564,179

DOUBLE EXHAUST VALVE FOR GAS BLAST CIRCUIT-BREAKERS INCLUDING A CHECK VALVE AND UNDERPRESSURE RESPONSIVE VALVE

Rintje Boersma, Harmelen, and Gijsbert W. Irik, Bilthoven, Netherlands, assignors to N.V. COQ Utrecht, Netherlands

Filed June 9, 1969, Ser. No. 831,452
Claims priority, application Netherlands, June 20, 1968, 6808656
Int. Cl. H01h *33/54, 33/80, 33/86*
U.S. Cl. 200—148 2 Claims



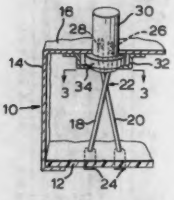
Metal clad gas blast circuit breaker which is exclusively adapted to interrupt a circuit, the switching element thereof being accommodated in a metal casing containing high-pressure and low-pressure compartments filled with insulating gas under overpressure, said circuit breaker comprising a safety valve and means to control said valve in such a manner, that the overpressures in said compartment can never fall below predetermined values.

3,564,180

RESILIENT CONTACTS FOR ROTARY SWITCH HAVING AN INTERMEDIATE POSITION OF UNSTABLE EQUILIBRIUM

Frits L. Lyvang, Wallenstein, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada

Filed Sept. 3, 1968, Ser. No. 756,793
Int. Cl. H01h *19/28, 19/14, 19/32*
U.S. Cl. 200—155 **9 Claims**



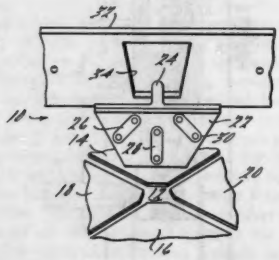
A switch includes a base member with first and second switch contact elements secured thereto and projecting therefrom. At least one of the elements is movable from a first position in which the elements are disengaged to a second position in which they are engaged. In both positions the elements cross each other when viewed from one angle but are on opposite sides of each other in the two different positions. At least the movable contact element is resilient and passes through a position of unstable equilibrium when moved between the two positions. When attempting to return to the first position after having been moved therefrom through the intermediate position, the movable contact element engages the other contact element.

3,564,181

SINGLE PLANE ELECTRIC REVERSING SWITCH FOR MOTOR OPERATION CONTROL

William W. Chirota, Dearborn; Carl G. Rigge, Dearborn Heights, and Thomas Shewchuck, Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 15, 1969, Ser. No. 816,253
Int. Cl. H01h *1/36*
U.S. Cl. 200—164 **2 Claims**



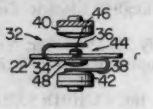
An electric switch having a substantially planar configuration and adapted to interconnect a current source and a reversible electric motor for multidirectional motor operation and to electrically connect the motor for dynamic braking upon the cessation of current flow to the motor. Flat conductors connected to the current source and motor converge upon and are uniquely arranged about a point on a circuit board. Plural conductive bridging elements mounted on a manually movable switch actuator are movable to plural switch positions in intimate contact with the conductors to effect desired electrical interconnection of the conductors.

3,564,182

SNAP SWITCH HAVING S-SHAPED SPRING LEAF ON THE MOVABLE SWITCH BLADE THEREOF

John W. Habecker, Grove City, Ohio, assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 10, 1968, Ser. No. 720,039
Int. Cl. H01h *1/12*
U.S. Cl. 200—166 **2 Claims**



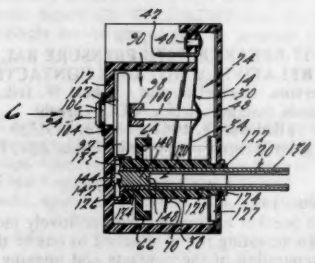
This application discloses a switch mechanism and method in which an S-shaped spring leaf is secured to the movable blade end of a snap blade of a switch construction. The spring leaf is originally straight and is secured to the blade end in straight condition and then is bent into an S shape. The S-shaped spring has reversely bent ends on opposite sides of a central leaf portion that is attached to the blade end by means of movable contact heads. The reversely bent leaf ends engage stationary contacts on opposite sides of said reversely bent ends and on opposite sides of the movable blade end. The leaf ends maintain contact with the respective stationary contact and the respective movable contact head during vibration or chatter until the snap over of the blade occurs. Contact bounce after snap over is also dampened by the other reversely bent leaf spring end, when it engages the other stationary contact. The blade may be a snap blade, with a C-shaped spring, and may be actuated by a plunger. The entire switch construction may be contained within a switch casing.

3,564,183

THERMOSTAT ADJUSTING MEANS

Robert W. Eshelman, Ann Arbor, Mich., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed Nov. 21, 1968, Ser. No. 777,831
Int. Cl. H01h *1/34*
U.S. Cl. 200—166 **8 Claims**



A switch assembly having a pair of mateable contacts for controlling a heater in response to a sensed temperature condition wherein the relationship of the contacts is preset by means of a cam member to select the operating temperature at which the contacts will open or close. The calibration of the switch is effected by means of a calibrating screw threadedly received in a bore formed in the cam member.

3,564,184

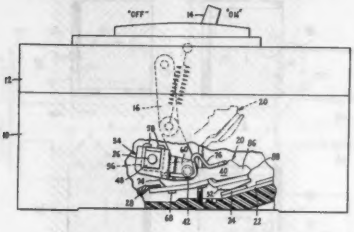
ELECTRIC CIRCUIT BREAKER

George E. Gauthier, Plainville, and Keith W. Klein, Simsbury, Conn., assignors to General Electric Company

Filed Jan. 27, 1969, Ser. No. 794,289
Int. Cl. H01h *1/02*
U.S. Cl. 200—166 **10 Claims**

A movable contact-supporting arm comprising a relatively high conductivity low strength flat plate portion disposed

with its major planar surface generally at right angles to the direction of movement of the contact arm and a relatively low conductivity high strength backing plate having its major planar surface disposed generally parallel to the direction of movement of said contact arm to form a generally T-shaped cross-sectional configuration, and a contact member mounted on the front surface of the high conductivity plate portion by suitable means, such as by welding.

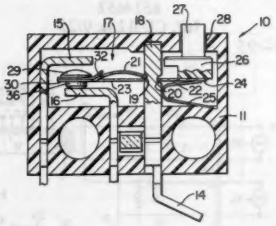


3,564,185

ELECTRICAL SWITCH CONSTRUCTION WITH SHIELD

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 24, 1969, Ser. No. 801,488
Int. Cl. H01h *9/30*
U.S. Cl. 200—166 **10 Claims**



An electrical switch construction having a movable switch blade carrying an electrical contact means to be moved into and out of electrical contact with another contact means of the switch construction so as to be adapted to make and break an electrical circuit, a shield being carried by the movable blade to prevent an electrical arc from impinging against a flexure point of the blade as the blade moves the contact means thereof out of contact with the other contact means to break the electrical circuit.

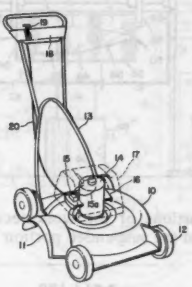
3,564,186

SWITCH CONTROL MECHANISM

Robert A. Mittelstadt, Burnsville, and Heinrich F. Tetzlaff, St. Paul, Minn., assignors to Toro Manufacturing Corporation, Minneapolis, Minn.

Filed Sept. 4, 1968, Ser. No. 757,388
Int. Cl. H01h *3/02*
U.S. Cl. 200—172 **15 Claims**

A remote control lever for operating the "On-Off" switch of the motor of an electric mower. The lever is mounted on the handle and manipulated by the operator while standing behind the handle. The lever travels in parallel offset tracks so that in traveling from the "Off" to the "On" position, the lever comes to a full stop at the offset point and must be forcibly moved from one slot to the other in order to reach the "On" position.

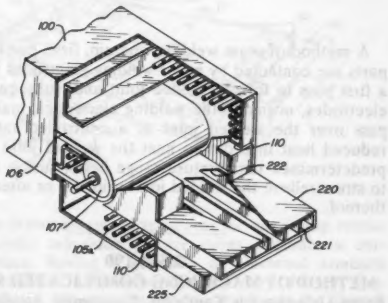


3,564,187

MICROWAVE OVEN

Franklin J. Smith, Diablo, Calif., assignor to Cryodry Corporation, San Ramon, Calif., a corporation of California

Filed Jan. 15, 1969, Ser. No. 791,445
Int. Cl. H05b *9/06, 5/00*
U.S. Cl. 219—10.55 **7 Claims**



A continuous process microwave oven especially adapted for heating bulky low-density materials in which relatively high-speed input and output vibratory conveyors are provided.

3,564,188

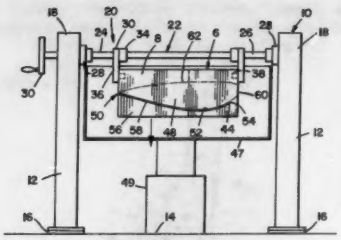
ELECTRIC DISCHARGE METHOD OF CUTTING SUSPENDED METAL WORK PIECES

Robert P. Dathe, Lafayette, Calif., assignor to Hexcel Corporation, Dublin, Calif.

Filed May 7, 1969, Ser. No. 822,582
Int. Cl. B23b *1/08;* **B23d** *23/02*
U.S. Cl. 219—69 **8 Claims**

A method for cutting workpieces with electric discharges between the workpiece and a cutting wire being passed

therethrough. The workpiece is suspended from above so



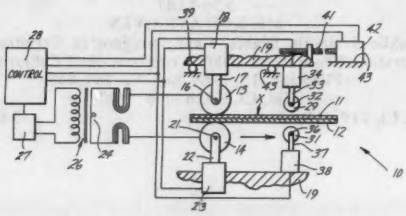
that severed portions of the workpiece are gravitationally biased away from the suspended portion of the workpiece.

3,564,189

STRESS RELIEVING FEATURE ON STRIP WELDERS

Ellsworth E. Rhodes, Bangor Township, Bay County, Mich., assignor to Newcor, Inc., Bay City, Mich.

Filed Oct. 4, 1968, Ser. No. 765,154
Int. Cl. B23k *11/06, 31/06*
U.S. Cl. 219—83 **11 Claims**



A method of seam welding wherein, first, portions of work parts are contacted by roller-welding electrodes which make a first pass to form a welded joint and, subsequently, roller electrodes, normally the welding electrodes, make a second pass over the welded joint at a controlled rate and at a reduced heat in order to heat the welded joint to within a predetermined temperature range below fusion temperature to stress relieve the welded joint prior to, or after, planishing thereof.

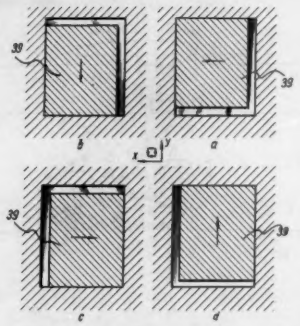
3,564,190

METHOD OF MACHINING COMPLICATED SURFACES

Sergo Gevorkovich Kandajan, Konstantin Agasievich Mndzhojan, Eduard Petrosovich Gevorkjan, Erevan, Anatoly Izrailevich Aronov, Arkady Timofeevich Kravets, Alexandr Shmilovich Opolinsky, and Petr Evmenovich Korochkin, Moscow, U.S.S.R., assignors to Experimentalny Nauchno - Issledovatelsky Institute Metallorenzhushichikh Stankov, Moscow, U.S.S.R.

Filed Sept. 25, 1963, Ser. No. 311,383
Int. Cl. B23p *1/04, 1/08, 1/12*
U.S. Cl. 219—69 **10 Claims**

The formation of a complex surface on a workpiece in which a workpiece and a tool having a contour providing an operative cutting surface substantially complementary to the desired surface to be formed are supported in overlapping relationship and the tool and workpiece are subjected to a relative translational forming movement along a closed trajectory line in a plane perpendicular to the direction of feeding movement so that any point on the operative cutting surface of the tool follows an identical trajectory to progressively engage points on the operative movement along a closed trajectory line in a plane perpendicular to the direction of feeding movement so that any point on the operative cutting surface of the tool follows an identical trajectory to progressively engage points on the operative surface of the tool with the workpiece. The relative forming movement is continued until the workpiece is formed to provide the desired complex surface. An electrolyte can be introduced between the tool and workpiece and an electric current supplied to the tool and workpiece for providing a combined electromechanical forming operation as well as supplying an abrasive suspension between the tool and workpiece.

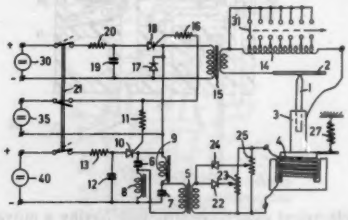


3,564,191

DEVICE FOR RESISTANCE PERCUSSIVE WELDING COMPRISING MEANS FOR SEPARATING TWO WORKPIECES AND THEN CONTACTING THEM AGAIN

Anne Evert Elzer, and Johan N. Dommering, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1966, Ser. No. 590,620
Claims priority, application Netherlands, Nov. 10, 1965, 6514652
Int. Cl. B23k *9/22*
U.S. Cl. 219—95 **10 Claims**



A resistance percussive welding device utilizes an electromagnet for separating the workpieces and subsequently bringing them back into contact. The electromagnet is supplied with a current that first flows in one direction and then in the opposite direction during the welding period.

3,564,192

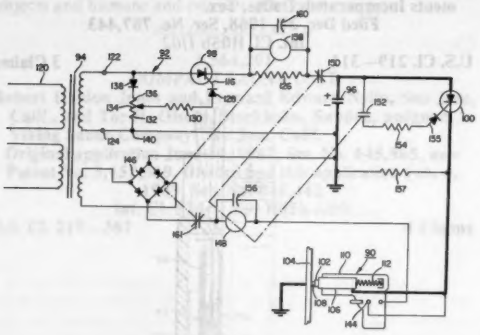
SOLID-STATE SWITCHING-CIRCUIT FOR CAPACITOR DISCHARGE STUD WELDING

Charles C. Pease, Pennsauken, and Lawrence P. English, Haddon Heights, N.J., assignors to Omark Industries, Inc., Portland, Oreg.

Continuation-in-part of application Ser. No. 279,986, May 13, 1966, now abandoned. This application Apr. 30, 1968, Ser. No. 725,324
Int. Cl. B23k *9/20*
U.S. Cl. 219—098 **5 Claims**

Welding apparatus including a welding gun for holding a stud to be welded to a workpiece and a source of welding

energy including a capacitor together with current control means for discharging the capacitor across the stud and workpiece to effect the weld where the current control means includes a gating rectifier between the capacitive



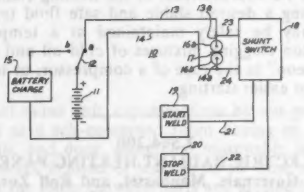
power supply and the stud and workpiece and a bleed resistor across the capacitive power supply and a cathode of the gating rectifier and parallel to the stud and workpiece to control *dV/dt* between the anode and cathode of the gating rectifier.

3,564,193

DIRECT CURRENT WELDING SYSTEM HAVING MINIMUM INDUCTANCE

Paul M. Erlandson, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 28, 1968, Ser. No. 716,855
Int. Cl. B23k *11/26*
U.S. Cl. 219—108 **7 Claims**



An electrical resistance direct current welding system is disclosed including circuitry providing low inductance and having switching means connected adjacent the welding electrodes whereby the current flow to the electrodes may be interrupted with no damaging arc resulting.

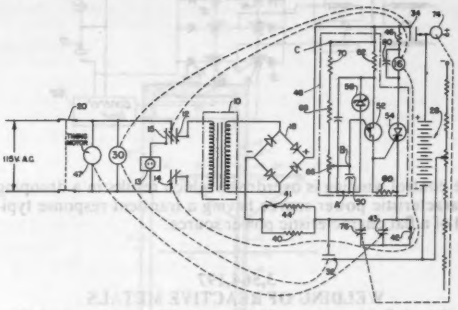
3,564,194

TEMPERATURE-COMPENSATING STUD-WELDING POWER SUPPLY

Charles C. Pease, Pennsauken, N.J., assignor to Omark Industries, Inc., Portland, Oreg.

Continuation of application Ser. No. 427,206, Jan. 8, 1965, now abandoned. This application June 26, 1968, Ser. No. 751,333
Int. Cl. B23k *11/26*
U.S. Cl. 219—108 **4 Claims**

A temperature-compensating circuit which employs a voltage divider across a battery to be charged which has a thermistor in one leg thereof and a capacitor across the opposite leg thereof. The capacitor, on reaching a predetermined charge, supplies a gating pulse through a unijunction transistor to a silicon controlled rectifier which operates a relay for discontinuing charging of the battery. A relay in the discharge circuit of the welding apparatus senses welding current and breaks the current flow through the silicon-controlled rectifier to deenergize the relay and reset the circuit



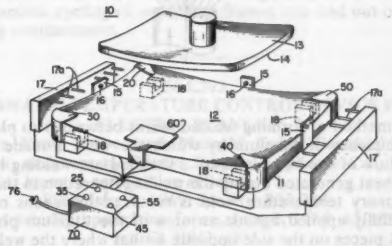
for recharging of the battery following partial discharge thereof. A capacitor in parallel with the relay maintains the relay energized a predetermined time to prevent recharging of the battery until the welding cycle is completed.

3,564,195

MASK-TO-FRAME WELDING INDICATOR

Robert Ploog, Park Ridge, Ill., assignor to Admiral Corporation, Chicago, Ill.

Filed Nov. 5, 1968, Ser. No. 773,434
Int. Cl. B23k *9/10*
U.S. Cl. 219—109 **10 Claims**



A mask-to-frame assembly apparatus for use in the manufacture of color television picture tubes, includes a curvilinear surface, having a plurality of electrical contacts disposed thereabout. A corresponding plurality of lamps coupled, respectively, between the shadow mask and the electrical contacts, are illuminated when the mask is properly engaged with the surface. The assembly apparatus further includes an electrical interlock, coupled to the lamps which permits energization of the mask-to-frame welding apparatus when the shadow mask is properly engaged.

3,564,196

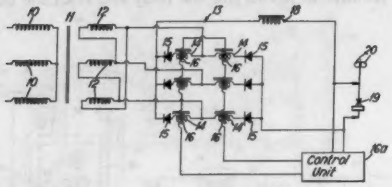
MAGNETIC AMPLIFIER WELDING POWER SOURCES

James C. Needham, Saffron Walden, and Albert W. Carter, Stapleford, Cambridge, England, assignors to National Research Development Corporation, London, England, a British corporation

Filed Dec. 17, 1968, Ser. No. 784,377
Claims priority, application Great Britain, Dec. 20, 1967, 57921/67
Int. Cl. B23k *9/10*
U.S. Cl. 219—135 **9 Claims**

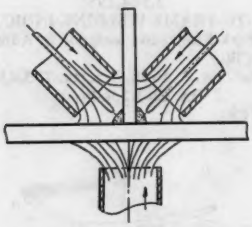
A power source for arc welding includes a magnetic amplifier, the control winding of which is connected in a control circuit which compares the arc voltage with a standard

reference signal. The amplifier is supplied with an alternating current having a frequency between 200 and 2,000 c.p.s. and



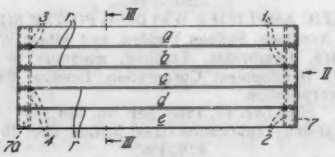
the control winding is overdriven which results in a drooping characteristic power source having a transient response typical of a flat characteristic power source.

3,564,197
WELDING OF REACTIVE METALS
Christoph Bohlen, Untere Hangstr.14, 5841 Lichtendorf, Germany
Filed Mar. 21, 1969, Ser. No. 809,147
Claims priority, application Germany, Mar. 21, 1968, 1,765,015
Int. Cl. B23k *9/00*
U.S. Cl. 219—137 **1 Claim**



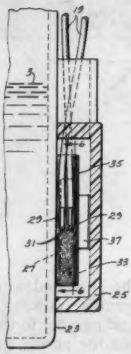
A method of forming welded seams between two plates or work pieces of titanium by which the weld is made at the juncture of the two plates by a shielded arc welding burner. The heat generated during the welding operation in the quasi stationary temperature weld is removed by means of fluid forcefully applied against an area of the titanium plates or work pieces on the side opposite to that where the welding is taking place so as not to reach the welding area and thereby to effect cooling to a temperature below the critical range.

3,564,198
HEATING ELEMENT
John Tiverton Watson, Deptford, England, assignor to Molins Machine Company Limited, London, England
Filed Nov. 15, 1968, Ser. No. 776,104
Claims priority, application Great Britain, Nov. 17, 1967, 52516/67
Int. Cl. H05b *1/00*
U.S. Cl. 219—243 **9 Claims**



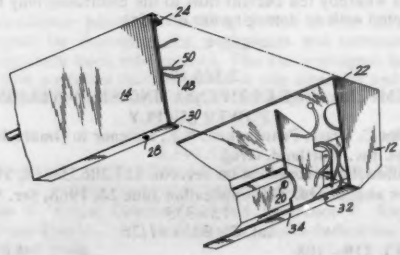
A heating element comprises a member of low specific heat material, providing a heating surface flanked by two parallel side flanges and having electric connections at its ends; several such elements may be assembled in parallel positions to present a continuous heating surface, the electrical connection preferably being a series connection.

3,564,199
SELF-REGULATING ELECTRIC FLUID-SUMP HEATER
Robert F. Blaha, Dedham, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 30, 1968, Ser. No. 787,443
Int. Cl. H05b *1/02*
U.S. Cl. 219—311 **3 Claims**



A self-regulating temperature-controlling semiconductive element having a so-called anomalous positive temperature coefficient (PTC) of resistivity is sandwiched between electrical contacts attached thereto and encapsulated within electrically insulating but thermally conductive material to form an assembly to be placed in heat-exchange relationship with a fluid the temperature of which is to be controlled. In particular, the assembly is immersed in oil within an oil sump of a compressor, internal-combustion engine or the like; or attached to the outside of the casing of such a sump. The anomalous PTC characteristic of the heating element results in maintaining a desired stable and safe fluid temperature. Thus oil may be safely maintained at a temperature to prevent piston clogging mixtures of cold oil and refrigerant such as "Freon" in the case of a compressor, or to thin cold engine oil for easier starting.

3,564,200
ELECTRIC RADIANT HEATING PANEL
Anthony J. Governale, Manhasset, and Rolf Zurwelle, Port Washington, N.Y., assignors to Elektra Systems, Inc., Farmingdale, N.Y.
Filed Jan. 9, 1969, Ser. No. 790,063
Int. Cl. H05b *3/20*; F24d *13/00*
U.S. Cl. 219—345 **1 Claim**



A heating system employing electromagnetic wave energy propagation to produce heat at the point of absorption of the electromagnetic waves. The system includes a radiator having a vitreous coating within which is positioned a heat source. A reflector is positioned rearwardly of the antenna in

proximity of said heat source. The heat source is operable to cause primary electromagnetic wave energy emission from the vitreous coated radiator and the reflector is operable to cause the electromagnetic wave energy emitted by the rearward surface of the antenna to be reflected back upon the antenna to cause enhanced emission therefrom. The emitted electromagnetic waves are absorbed by remotely disposed objects and humans and converted to heat energy.

3,564,201
COMPACT SAUNA UNIT

Robert Haldon Jones and Lennard Edward Nylin, San Jose, Calif., and Tor H. Olssen, Stockholm, Sweden, assignors to Viking Sauna Company, San Jose, Calif.

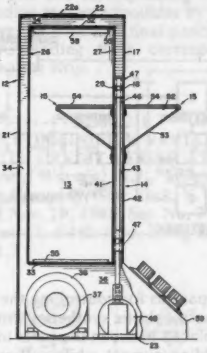
Original application June 14, 1967, Ser. No. 645,965, now Patent No. 3,452,369. Divided and this application Feb. 4, 1969, Ser. No. 816,442
Int. Cl. F24c 7/00; H05b 1/00
U.S. Cl. 219—367 **4 Claims**

A compact sauna unit, capable of use by one person alone is provided as a self-contained room having its own floor, ceiling, walls, and door, assembled reasonably snugly while enabling a small amount of leakage of air from outside into the room at the joints between parts and around the door. In the room is a seat to hold a person with his feet spaced well above the floor. A heater unit is contained in the door and comprises a housing defining a plurality of generally vertically extending ducts with air inlets at the lower end and air outlets at the upper end. One duct is an inner duct adjacent the inner surface of the door for keeping the inner surface of the housing cool; an outer duct lies adjacent the outer surface of the door for keeping that outer surface cool; and a central duct is sandwiched between the inner and outer ducts and separated from them by thin metal walls. Electrical rod heating means in said central duct supplies heat; in fact, the sole source of heating for the sauna unit, also serving to provide heat to the inner and outer ducts through the thin metal duct walls, for causing upward movement of cooling air therethrough. There is an air exhaust conduit through the door, vertically above the heater unit, for exhausting a controlled amount of air from the room. Typically, the door has a window spaced above the heater unit, and the exhaust conduit is provided along the upper edge of the window, comprising a horizontal conduit between a vertical inlet passage leading down from an inlet above the horizontal conduit and a vertical outlet passage leading up to an outlet above the horizontal conduit. The vertical inlet and outlet passages are located high, above eye level of tall persons when standing inside or outside the room, and are shielded from view by vertical fascias so as to be not readily observable except from above them.

3,564,202
SPECTACLE FRAME HEATING APPARATUS

Gerd M. Oppenheim, P.O. Box 6091, San Francisco, Calif.

Filed Apr. 7, 1969, Ser. No. 814,028
Int. Cl. F27d 11/02
U.S. Cl. 219—400 **10 Claims**

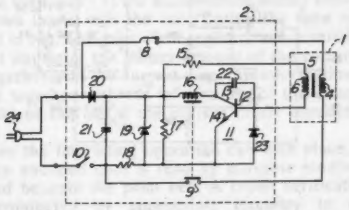


An apparatus for heating plastic spectacle frames to permit the insertion of lenses into the openings provided therefor. The apparatus includes a thermally insulated heating compartment, with a frame supporting element movable to selectively place the frame in the compartment and remove it therefrom. Controls are provided for controlling the heat and exposure period, such controls providing for selective manual or automatic cycling of sequential frames into and out of the heating compartment.

3,564,203
AUTOMATIC TEMPERATURE CONTROL DEVICE FOR ELECTRIC BLANKET

Akisada Naoi, Tokyo, and Masaaki Kubo, Funabashi-shi, Japan, assignors to Hitachi Heating Appliance Co., Ltd., Tokyo, Japan, a corporation of Japan

Filed June 4, 1969, Ser. No. 830,380
Claims priority, application Japan, June 5, 1968, 43/38022
Int. Cl. H05b 1/02
U.S. Cl. 219—491 **3 Claims**

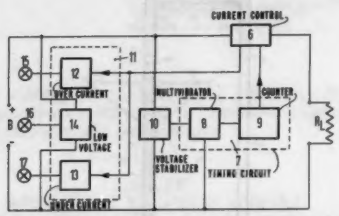


Improvements of the automatic temperature control device in an electric blanket for ordinary household use, removing troubles and high cost caused by employing a delicate relay, premature deterioration of a heat-sensitive layer, inconvenience in reheating after breaking of a switch due to abnormal overheating of a heating wire, etc. by means of an improved automatic control device.

3,564,204
APPARATUS FOR CONTROLLING THE HEATING CURRENT FOR WELDING THERMOPLASTIC SYNTHETICS

Heinz Mense, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 6, 1967, Ser. No. 644,016
Claims priority, application Germany, June 6, 1966, S104204
Int. Cl. H05b 1/02
U.S. Cl. 219—497 14 Claims

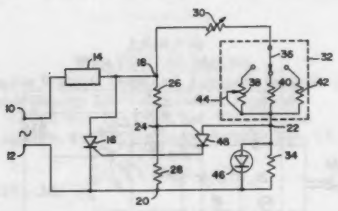


An electrical apparatus for controlling the current used for welding parts of thermoplastic synthetics with the aid of heating wire which is placed between the parts to be joined and is heated by the welding current while sufficient joining pressure is applied. The apparatus regulates heating current at a desired value independently of the energizing voltage and independently of the resistance of the interposed heating wire. For this purpose a voltage is taken from a voltage-drop resistor connected in series with the heating wire and employed for lighting a lamp which illuminates a photoresistor. The resulting variation in voltage at the photoresistor is amplified and used for regulating the welding current. This permits giving the voltage-drop resistor in the circuit of the heating wire an extremely small size thus reducing the power losses. The current regulation is preferably effected in accordance with a predetermined heating program which is automatically monitored in dependence upon the ambient temperature sensed by a thermistor.

3,564,205
TEMPERATURE CONTROL CIRCUITS

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 20, 1969, Ser. No. 878,336
Int. Cl. H05b 1/02
U.S. Cl. 219—499 16 Claims

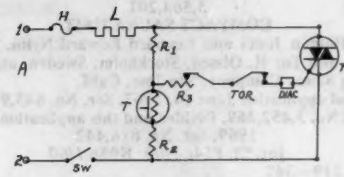


Temperature control circuits including a bridge network having an output controlling a programmable unijunction transistor, a load controlling the heat supplied to an area, an SCR in series with the load and controlled by the programmable unijunction transistor in accordance with temperature sensed by a thermistor in the bridge network, and a unidirectionally conductive limiter diode connected with the bridge network to permit control operation on only the initial portion of positive half cycles of a supply voltage. Modifications of the temperature control circuits include means for increasing temperature differentials to require discrete temperature changes to energize and deenergize the load.

3,564,206
FAIL-SAFE SENSOR/OVERRIDE FOR CIRCUIT

Peter Lauck III, Princeton, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 810,156, Mar. 25, 1969. This application Oct. 14, 1969, Ser. No. 866,355
Int. Cl. H05b 1/02
U.S. Cl. 219—501 5 Claims

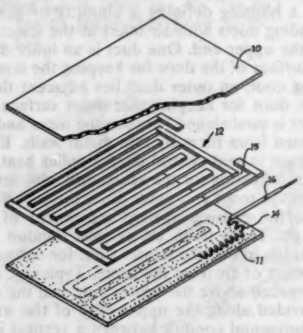


A temperature override sensor for a control circuit for a heating device including an electric switch and temperature control means to control and regulate the amount of heat developed by a heating device. The temperature override sensor is so connected in the circuit as to be operable to permit normal temperature control operation of activators for the heating element in a desirable ambient temperature condition, and operable under abnormal blanket and ambient temperature conditions to override the normal operating components and circuitry to shut off completely functioning of the heating element or device. This is accomplished by physically mounting the temperature override sensor on a control or operating actuator for the heating element or device, so that a critical sensing of the temperature of the actuating device is compared with the, for example, voltage divider in receptacle and with the temperature range in which the heating device is utilized, the disparity between the two temperature ranges in the voltage divider means, one critical, one wide, permits the use of the safety override device that will cut off any control, and which further does not interfere with the normal operation of the heating control itself unless an untoward or unsafe condition of room temperature or connection plug temperature exists.

3,564,207
ELECTRIC INFRARED HEATER

Stanley V. Joeckel, Wayne, N.J., assignor to Infra-Red Systems, Inc., Riverdale, N.J.

Original application Dec. 12, 1966, Ser. No. 600,840. Divided and this application July 24, 1969, Ser. No. 870,867
Int. Cl. H05b 3/28
U.S. Cl. 219—544 1 Claim



An electric heater for emitting infrared radiations having a plurality of insulating elements adhesively sandwiched between a pair of superimposed sheets to form a maze therein with a zigzag passageway, and a continuous infrared radiating element disposed in the passageway with terminals

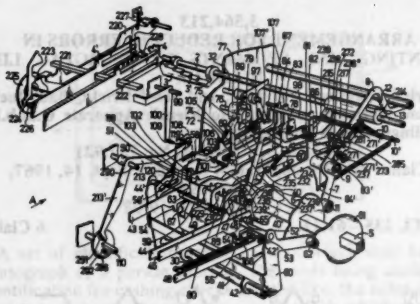
at both ends thereof. The sheets are composed of fibrous aluminum oxide and silicon dioxide and interstices in the sheets are filled with silicon dioxide particles to provide a good emitter of infrared radiation having an emissivity factor of about 90 percent.

3,564,208

APPARATUS FOR PREVENTING PRINTING AND INDICATING THE SAME IN CALCULATING MACHINES IN CASE THE CAPACITY OF THE CALCULATING MACHINE IS EXCEEDED

Wilhelm Machmer, Moorenbrunn, and Andreas Metschnabl, Nurenberg, Germany, assignors to Diehl, Nurenberg, Germany

Filed Nov. 24, 1969, Ser. No. 879,458
Claims priority, application Germany, Nov. 22, 1968, Apr. 11, 1969, 1,810,255;1,918,369
Int. Cl. G06k *15/00; G06c 19/00*
U.S. Cl. 235—60.25 **21 Claims**



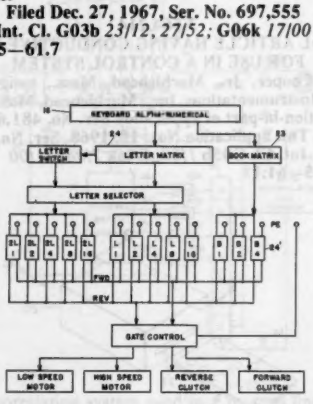
The specification discloses an apparatus in a calculating machine for preventing the taking of a result from the machine if the capacity thereof is exceeded. Rotatable digit counting means is felt by feeler member which tilt when a condition of overcapacity of the machine exists. A control member which, when actuated, prevents a result from being taken from the machine is arranged to be actuated by the tilting of any one of the feeler members.

3,564,209

DATA STORAGE AND QUICK RETRIEVAL UNIT

Henry Loughnane, Little Falls, N.J., assignor to Tech Laboratories, Inc.

Filed Dec. 27, 1967, Ser. No. 697,555
Int. Cl. G03b *23/12, 27/52;* **G06k** *17/00*
U.S. Cl. 235—61.7 **9 Claims**



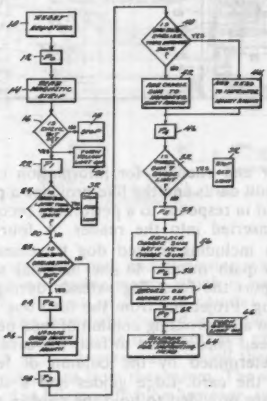
A microfilm retrieval apparatus for information arranged on microfilm in rows of pictures separated by transverse binary coded arrays of light and dark bit areas forming a plurality of code words corresponding to a "book" number and alphabetical letters. The apparatus has a keyboard with 26 "letter" key switches and a group of numbered "book" key switches. Data is punched into the apparatus in several steps, first by actuating a "book" key and then by sequentially actuating first and second "letter" keys. The first and second input steps encode respective first and second binary words in memory modules, there being one module for each bit. At this point, the film is moved by drive means in the proper direction, as sensed by photocells receiving light through the coded arrays on the film strip, and the film stops when the photocells sense film bits corresponding with those encoded in the corresponding memory modules by a third key actuation step, to move the strip to a final position, as determined by photocells responding to a corresponding transverse coded bit array on the strip.

3,564,210

APPARATUS COMBINING A VARIABLE AMOUNT IMPRINTER WITH CREDIT VERIFICATION CIRCUITRY

Anthony J. Presti, Warren, N.J., assignor to Farrington Manufacturing Company, New York, N.Y.

Filed Nov. 29, 1968, Ser. No. 779,716
Int. Cl. G06k *5/00;* **H04g** *3/00*
U.S. Cl. 235—61.7 **24 Claims**

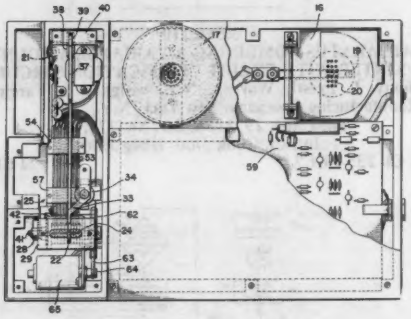


Disclosed is a credit verification imprinter for use with a credit card embossed or etched with data typically corresponding to the customer's name, address, and numerical identification. Also provided on the card is magnetically BCD encoded data relating to (1) the charge limit the card may be used for in a predetermined period of time, preferably a month; (2) the time interval in which the card was last used; and (3) the accumulated money total of charge purchases made with the card during the time interval indicated in (2). The sales clerk registers into a variable money amount imprinter the money amount of the current transaction together with the current date, this information to be imprinted together with the information of the charge onto a sales slip or the like if the current credit transaction is approved.

Before the imprinting operation can take place, the magnetically encoded data is read by movable read/write head disposed beneath the print bed. A credit verification test is then conducted by appropriate circuitry to determine whether the card has been used for credit transactions exceeding the limit listed in (1) above during the interval of time indicated by the month setting on the variable date wheels of the imprinter. Other checks are also made to establish the authenticity of the information magnetically encoded on the card to insure that no tampering or data transmission errors have occurred. Different colored lights are provided on the imprinter chassis to indicate the occurrence of different conditions detected by the data verification circuitry. Upon completion of the data verification check, a stop is removed from the path of travel of the imprinting head thereby permitting the imprinting operation to take

place. After the imprinting head has been returned to its start position a switch is caused to close and thereby reset all credit verification registers preparatory to the next credit operation.

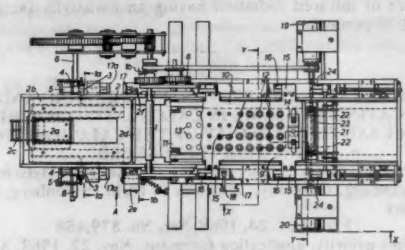
3,564,211
FEEDING MECHANISMS FOR CARD READERS
David R. Angus, R.D. 1–463 Three Old Reaville Road, Flemington, N.J.
Filed Oct. 12, 1967, Ser. No. 674,899
Inc. Cl. G06k *7/04;* **H04m** *1/26;* **B65k** *5/04*
U.S. Cl. 235—61.11 **6 Claims**



A reader and encoder for information carried on cards such as credit cards and the like provides a plurality of tones as an output in response to a perforated record-carrying card which is inserted into the reader. A four-motion feeding mechanism including a feed dog traverses a substantially rectangular path normal to the material support, through which support the feed dog extends during the process of card feeding. Projecting from the feed dog towards and extending into a confronting column of feed perforations in the card, are feed pins aligned to feed the card along a straight path predetermined by the column of feed perforations formed in the card. Edge guides and a solenoid-operated card stop are provided to hold the card in the correct position prior to commencement of operation of the feeding mechanism so that feeding will be accurate, at a continuous speed; and all the information represented by the perforations will be sensed by a plurality of vertically reciprocated, spring-biased feeler pins or probes connected to actuate switches in response to extension of the probes through code-bearing perforations representing coded information punched into the card. Each of the switches controlled by the probes is adapted to actuate an oscillator generating a predetermined audio tone which is supplied to a speaker. A shaft positioner is provided for arresting the motor shaft near a predetermined position.

3,564,212
APPARATUS FOR SELECTING, ANALYZING AND RECORDING DATA
Albert Leslie North, 19 Holland Walk, Stanmore, Middlesex, England
Continuation-in-part of application Ser. No. 226,043, Sept. 25, 1962, now abandoned, and a continuation-in-part of 581,140, Sept. 19, 1966, now abandoned. This application June 12, 1968, Ser. No. 736,406
Int. Cl. G06k *7/04*
U.S. Cl. 235—61.11 **17 Claims**

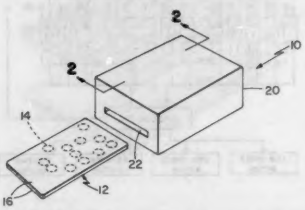
Data processing apparatus for detecting, counting and otherwise analyzing data stored on cards in punched or like form wherein the complete pattern of data on the card is sensed and detected simultaneously in one passage of the card through the analyzer (as distinguished from column-by-column or field-by-field detection); any desired pattern representing classes, subclasses and combinations of both data may be detected in a single passage of the card through the apparatus by selector switch circuits which couple the sensing elements in the selected combination to trigger counters or the like when the corresponding pattern appears in the card.



3,564,213
ARRANGEMENT FOR REDUCING ERRORS IN COUNTING LINE SEGMENTS OF A ZIGZAG LINE DIAGRAM
Siegfried Spauszus, Villingen, and Josef Krickl, Bad Duerrheim, Germany, assignors to Kienzle Apparate G.m.b.H., Villingen, Black Forest, Germany
Filed Sept. 6, 1968, Ser. No. 757,921
Claims priority, application Germany, Sept. 14, 1967, 1,549,794
Int. Cl. G06k *7/10, 9/08*
U.S. Cl. 235—61.11 **6 Claims**

To reduce errors due to surface imperfections of a zigzag line diagram, the line diagram is scanned along two parallel paths parallel to the center line of the diagram and on opposite sides thereof. The scanning means therefore alternately generate pulse pairs. Logic circuits select the second one of each pair as a counting signal. The selection takes place only if a pulse generated by the other scanning means and a pulse by the scanning means from which the counting pulse is to be selected precede the counting pulse. The so-selected counting pulses are counted and the results stored.

3,564,214
CONTROL ARTICLE HAVING CONDUCTIVE INSERTS FOR USE IN A CONTROL SYSTEM
Irving B. Cooper, Jr., Marblehead, Mass., assignor to Industrial Instrumentations, Inc., Marblehead, Mass.
Continuation-in-part of application Ser. No. 481,684, Aug. 23, 1965. This application Nov. 18, 1968, Ser. No. 776,746
Int. Cl. G05b *1/00;* **G06k** *7/08, 21/00*
U.S. Cl. 235—61.11 **9 Claims**



A security system includes a card having several copper discs in the order of 5 mils in thickness encased within opaque material and a card reader that has a sensing area in

which the card is inserted. On one side of the sensing area are a group of primary windings disposed on pole pieces and on the opposite side of the sensing area are corresponding secondary windings, also disposed on pole pieces. On insertion of a card into the reader a switch is closed which applies a pulse to the primary windings to generate magnetic fields. In response to those magnetic fields that are not absorbed by copper discs, the corresponding secondary windings generate output signals indicative of the coded information on the card. Coding arrangements are also disclosed which make the card difficult to counterfeit.

3,564,215
IDENTIFICATION DEVICE

Walter P. Peeples, Jr.; Olan F. Horn, and John E. Greaney, Houston, Tex., assignors to General Nuclear Inc., Houston, Tex.

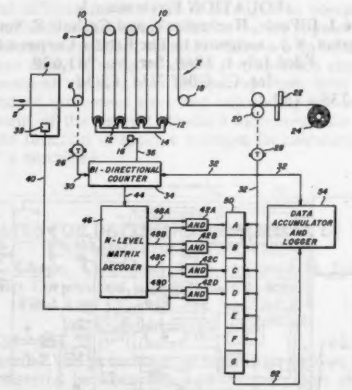
Filed May 15, 1969, Ser. No. 824,942
Int. Cl. G06k *19/08, 7/10*
U.S. Cl. 235—61.12 **8 Claims**

A set of identification cards, each of which may have a photograph of a person thereon, the cards being useful for identification for cashing checks and the like; the color of the card may indicate the maximum size check which may be cashed, and the amount of radioactive material on the photograph on each card may indicate the maximum size check which may be cashed.

3,564,216
DATA CORRELATION SYSTEM

John F. Laycak, West Mifflin, Pa., assignor to United States Steel Corporation

Filed Mar. 27, 1968, Ser. No. 716,641
Int. Cl. G06m *7/00, 3/14*
U.S. Cl. 235—92 **4 Claims**

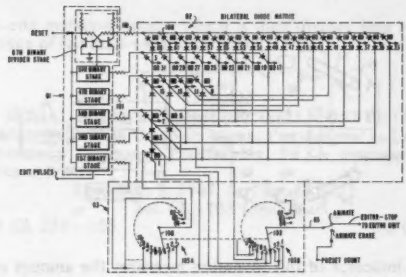


A data correlation system used in a process line for elongated product includes a pulse generating tachometer driven at a speed proportional to product speed before entering a product accumulator, and a second tachometer driven at a speed proportional to product speed after the accumulator. A bidirectional counter which is operated by the pulses is connected to an N-level matrix decoder to provide an output corresponding to the variable product length in the accumulator. One of a series of logic AND gates is enabled by the decoder to insert into a corresponding shift register element a data signal from a sensor appropriate for the type of data desired. The shift register, operated by pulses from the second tachometer is connected to a data accumulator and logger which receives the data signal from the shift register as the product region associated with the data signal passes a reference point in the process line.

3,564,217
COMBINED COUNT INDICATING AND PRESETTING SYSTEMS

Norman F. Bounsall, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Original application Oct. 2, 1961, Ser. No. 329,033, now Patent No. 3,342,932, dated Sept. 19, 1967. Divided and this application Mar. 16, 1967, Ser. No. 624,673
Int. Cl. H03k *21/36*
U.S. Cl. 235—92 **7 Claims**

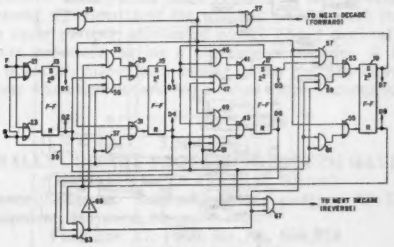


A combined count indicating and presetting system having elements coupled in a gating matrix which is connected to particular bistable elements of a binary counter. The gating matrix has particular terminals coupled to a selector, which produces selective signal levels representative of the count pattern presented at the counter, and which therefore may provide output indications from the system. The same gating matrix is also used in bilateral fashion however, so that upon application of an appropriate presetting signal, the bistable elements may be set into a desired count relationship for further control sequences.

3,564,218
BIDIRECTIONAL COUNTING SYSTEM

Clark M. Lay, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

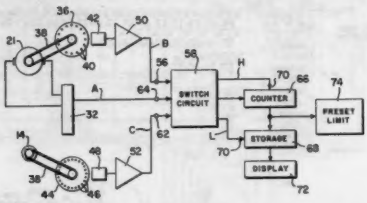
Filed Apr. 17, 1968, Ser. No. 722,046
Int. Cl. G06m *3/14*
U.S. Cl. 235—92 **1 Claim**



A bidirectional counting system is provided for use in a position indicating device wherein the displacement of a movable component is sensed by an interferometer. A feedback generator of the interferometer senses increments of

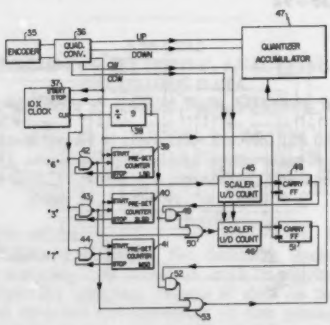
movement in a forward or reverse direction and generates a pair of phase-displaced signals one leading the other, depending upon the direction of movement. The leading signal is detected by a phase detector which generates an appropriate output signal at either a forward or reverse output. These outputs are applied to a bidirectional counter which registers pulses applied at a forward input as a counting increment and registers counts applied at a reverse input as a counting decrement. The counter is comprised of counting stages gated together so that the existing states of the counter stages enable the counter to register either a forward or reverse count without a separate direction command input. A display is provided to display the instantaneous net count of the forward or reverse pulses received.

3,564,219
INDICATING DEVICE
John S. Mutziger, East Moline, Ill., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware
Filed June 7, 1968, Ser. No. 735,277
Int. Cl. G06m *1/272*
U.S. Cl. 235—92 **4 Claims**



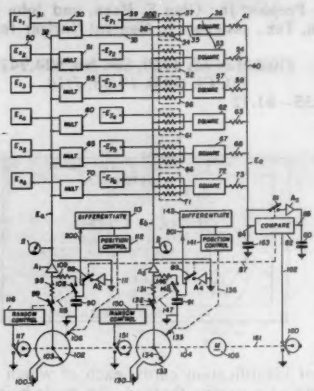
The indicator of this invention measures the amount of a web material wound upon a spool by utilizing the principle that the rate at which the spool rotates, as the web is wound or unwound therefrom, varies in proportion to the amount of the web material thereon. A pulse generator is provided for generating pulses which indicate the rotational velocity of the spool and a second pulse generator is provided for generating pulses which indicate the linear velocity of the web material. A counter counts the number of pulses generated by the linear web motion during each pulse generated by the rotating spool. The accumulated count is then stored and displayed for indicating the amount of the web material upon the spool.

3,564,220
DIGITAL SCALE CHANGING
John G. Peddie and Carl F. Reuter, San Antonio, Tex., assignors to H. Dell Foster Co., San Antonio, Tex.
Filed Oct. 8, 1968, Ser. No. 765,942
Int. Cl. H03k *21/00*
U.S. Cl. 235—92 **6 Claims**



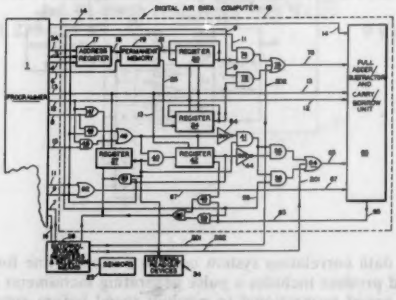
A digital scale factor changing apparatus includes a number of individually preset counter mechanisms for inserting a desired scale factor alteration in a digital clock signal wherein the overflow or carry signals from the individual preset counters are accumulated as the desired scale factor output.

3,564,221
OPTIMIZATION WITH RANDOM AND HISTORICAL VECTORS
Robert F. Wheeling, Mullica Hill, N.J., assignor to Mobil Oil Corporation
Filed Sept. 7, 1960, Ser. No. 054,503
Int. Cl. G05b *13/00*
U.S. Cl. 235—150.1 **8 Claims**



The invention relates to the production of an optimum value of a system output function which is dependent upon a plurality of variables where the effect of changes in the variables upon the function may be determined. An optimum is reached quickly and efficiently by changing each variable repetitively in a random manner initially and thereafter the tendency of the changes to be purely random is modified so that past history in the search for the optimum value tends to weight the randomness in favor of the most desirable direction toward optimum.

3,564,222
DIGITAL FUNCTION GENERATOR SOLVING THE EQUATION $F(x) = mx + b$
Salvatore J. DiPaolo, Hackensack, and Casimir S. Smialowicz, Livingston, N.J., assignors to The Bendix Corporation
Filed July 1, 1968, Ser. No. 741,620
Int. Cl. G06f *7/38, 15/34*
U.S. Cl. 235—152 **9 Claims**



The novel air data computer constructed according to the present invention has digital means which utilizes linear ap-

proximation techniques for computing air data parameters from air data curves. For each parameter the computer retrieves a slope m and an intercept b corresponding to a selected linear segment of an air data curve from a permanent memory and repetitively adds the retrieved slope m under control of an independent variable x corresponding to a sensed condition until the sum of the slopes equals the product mx of the slope and independent variable. The computer further adds the intercept b to the product mx in accordance with the following equation to provide a sum which is the dependent variable y corresponding to a point on an air data curve:

$$y=mx+b \quad (1)$$

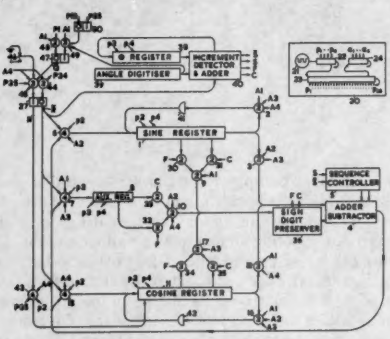
The computer also solves equation (1) when b is negative.

3,564,223

DIGITAL DIFFERENTIAL ANALYZER

Robert Herbert Harris, Farnborough, and Phillip Lance Owen, Church Crookham, England, assignors to National Research Development Corporation, London, England

Filed June 4, 1968, Ser. No. 734,298
Claims priority, application Great Britain, June 6, 1967, 26,155/67
Int. Cl. G06f *15/34*
U.S. Cl. 235—150.31 **15 Claims**



A digital differential analyzer is arranged to compute the sum of the first n terms of a Taylor series representing a function of an independent variable where n is an odd integer greater than unity. It includes means for detecting changes in the independent variable and comparing them with two or more standard increment sizes and calculating the effect of an increment of the nearest standard increment size on the value of the function. A specific example for calculating $\sin\theta$ and $\cos\theta$ is described.

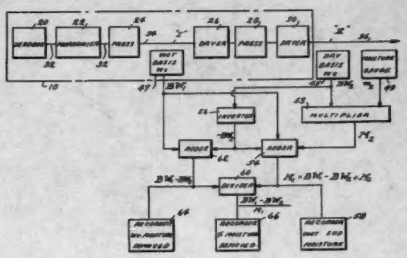
3,564,224

APPARATUS FOR DETERMINING PERCENT OF WET-END MOISTURE REMOVED

Henry R. Chope, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, a corporation of Ohio

Filed Aug. 13, 1968, Ser. No. 752,394
Int. Cl. G01n *23/16, 33/34*
U.S. Cl. 235—151.35 **12 Claims**

To determine the percentage of moisture removed from a traveling material between first and second points along its direction of travel, the difference in basis weight at those two points is divided by the wet-end moisture weight per unit area. The wet-end moisture weight per unit area is obtained by multiplying the dry-end basis weight by the dry-end percent moisture with the product being then added to the difference of the basis weights. In another embodiment, the wet-end moisture weight is obtained by use of two operational amplifiers, one of which operates as a multiplier providing an output proportional to the difference in the dry-end moisture weight and the dry-end basis weight. This output is then added to the wet-end basis weight to obtain the



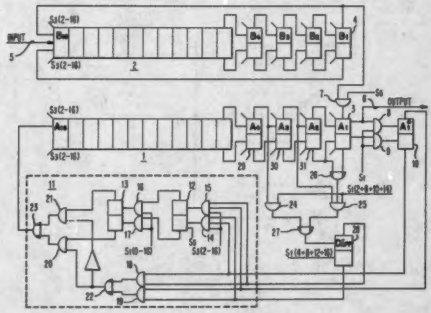
wet-end moisture weight, which is then divided into the difference of the basis weights as above.

3,564,225

SERIAL BINARY CODED DECIMAL CONVERTER

Charles W. Watson, Jr., Norristown, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa., a corporation of Pennsylvania

Filed Nov. 9, 1967, Ser. No. 681,731
Int. Cl. 1103 *13/258*
U.S. Cl. 235—155 **5 Claims**



The disclosure describes a converter in which the number to be converted is inserted into a shift register. The number is recirculated through the shift register in the direction of decreasing significance of the number. During each recirculation cycle partially converted binary coded decimal numbers are produced having a plurality of decades. A binary three is serially added to a decade of the partially converted numbers when that decade has a value which exceeds four.

3,564,226

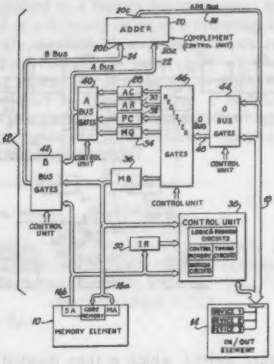
PARALLEL BINARY PROCESSING SYSTEM HAVING MINIMAL OPERATIONAL DELAY

Lawrence Seligman, Belmont, Mass., assignor to Digital Equipment, Maynard, Mass.

Filed Dec. 27, 1966, Ser. No. 604,956
Int. Cl. G06f *7/50, 7/52*
U.S. Cl. 235—164 **14 Claims**

A new electronic digital processor element has two groups of zero-delay registers, a single zero-delay adder, and zero-delay gates arranged to transfer information in the registers to the adder input terminals and to transfer information out-

put from the adder to the registers. All information transfers between the registers are by way of the adder and are controlled by sets of simultaneous level-type signals selectively applied to the gates.

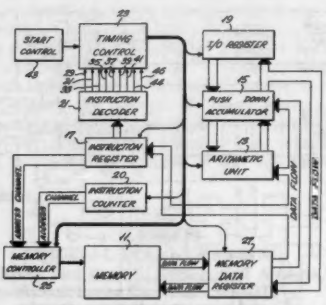


3,564,227

COMPUTER AND ACCUMULATOR THEREFOR INCORPORATING PUSH DOWN REGISTER

Dan M. Bowers, Deer Park, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.

Filed Dec. 14, 1967, Ser. No. 690,452
Int. Cl. G06f 7/385
U.S. Cl. 235—168 **16 Claims**



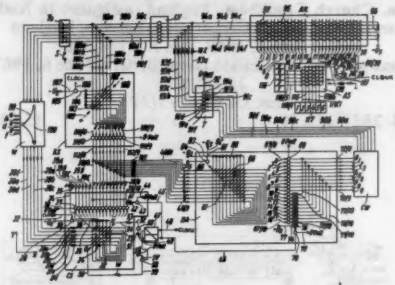
This specification discloses a stored program digital computer, including an accumulator which also functions as a push down storage register. The first stage of the accumulator functions as a conventional accumulator adding or subtracting the binary numbers represented by applied signals from the numbers stored therein leaving the results of the addition or subtraction in the first stage. Also, the results of multiplication operations are stored in the first stage of the accumulator. When a number is transferred to the accumulator from the memory of the computer, it is stored in the first stage of the accumulator and the number that is stored in the first stage is shifted to the second stage of the accumulator. The binary numbers, if any, stored in the second and higher numbered accumulator stages are shifted to the next higher numbered accumulator stage. The binary numbers may be transferred from the first stage of the accumulator to the memory and when such a transfer is made, the numbers stored in the second and higher numbered accumulator stages are shifted to the next lower numbered accumulator stage. In addition, the accumulator can be controlled to add or subtract the contents of the second accumulator stage from the first accumulator stage. When such addition or subtraction takes place, the numbers stored in the third and higher numbered accumulator stages are each shifted to the next lower numbered accumulator stage.

3,564,228

SERIAL DECIMAL ADDER UTILIZING MAGNETIC CORE MATRICES

Horst Herger, Bielefeld, Germany, assignor to Anker-Werke Aktiengesellschaft, Bielefeld, Germany

Filed Mar. 1, 1967, Ser. No. 624,645
Claims priority, application Germany, Apr. 28, 1966, A52292
Int. Cl. G06f 7/50, 5/02
U.S. Cl. 235—176 **16 Claims**



An electronic computer for the series-parallel processing of decimal numbers with the aid of decoder matrixes of ring cores coacting with an adder matrix of ring cores. Each of the matrixes is subdivided into two submatrixes of which at least one is inhibitable independently of the other. The half-select current wires of each matrix are linked with respective cores of both submatrixes. Each core in the decoder matrixes is linked with a different pair of such wires. The adder matrix has each core of only one of its submatrixes linked with a different pair of half-select current wires. The cores of the other adder submatrix are twice linked with a single one of the respective wires.

3,564,229

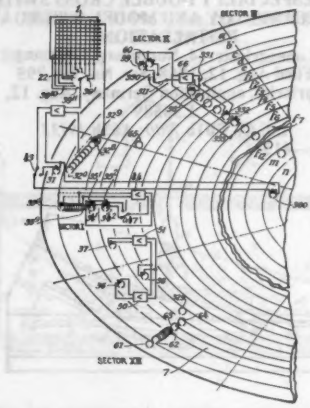
ARRANGEMENT FOR PERFORMING ARITHMETIC OPERATION USING A STATIC AND A DYNAMIC STORAGE

Gerhard Dirks, Los Altos Hills, Calif., assignor to Dirks Electronics Corporation, Los Altos Hills, Calif.

Continuation of application Ser. No. 357,013, Mar. 30, 1964, now abandoned , Continuation of application Ser. No. 728,838, Apr. 16, 1958, Continuation-in-part of application Ser. No. 432,093, May 25, 1954, Continuation-in-part of application Ser. No. 101,032, June 24, 1949, now abandoned. This application Jan. 23, 1969, Ser. No. 796,297
Int. Cl. G06f 7/50
U.S. Cl. 235—176 **4 Claims**

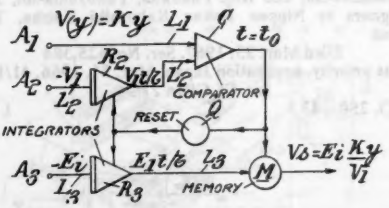
A keyboard has keys arranged in denominations and digits within a denomination, each key connecting a digit and denomination selection line, thus storing a digit. A disc has groups of storage locations corresponding to denominations and dynamic storage positions in each group corresponding to the digits, the disc moving relative to reading and writing heads, associated respectively with input and output storage positions on the disc. Each digit selection line is connected to a writing head. A distributor applies signals from the reading heads in a predetermined sequence to the denomination lines in synchronism with the movement of the disc past the read and write head. Signals are thus transferred from the input storage positions on the disc to the output storage positions,

the positioning in the output storage positions depending both upon the numbers stored in the input storage positions



on the disc and the numbers stored in the keyboard, as well as an arithmetic operation connecting the two numbers.

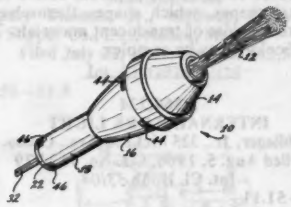
3,564,230
FUNCTION GENERATOR FOR LINEAR INTERPOLATION
Jean-Claude Carossi, Manosque, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Oct. 10, 1968, Ser. No. 766,448
Claims priority, application France, Oct. 12, 1967, 124,284
U.S. Cl. 235—197 3 Claims



The linear interpolation is realizable in a device having three channels with two integrators disposed respectively in the second and third channels, and a comparator. A memory stores the output of the third channel and a reset unit resets the second and third channels to zero when the comparator detects the equality of the outputs of the first and second channels.

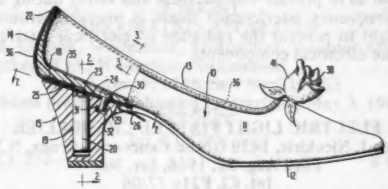
3,564,231
ILLUMINATION DEVICE
Joe P. Bruce, Santa Ana, and Robert S. Rosenast, Newport Beach, Calif., assignors to Poly-Optics, Inc.
Filed Sept. 26, 1968, Ser. No. 762,832
Int. Cl. F21v *29/00*
U.S. Cl. 240—1 8 Claims

A device for holding and illuminating the bundled end of a plurality of optical fibers wherein a hollow body is provided with: a plurality of ribs at one end for securing the bundled optical fibre ends; a light bulb at the other end; a reflective inner surface surrounding the light bulb and concentrating its rays onto the fiber bundled end; a heat reflecting and light transmitting disc between the bulb and bundled end to



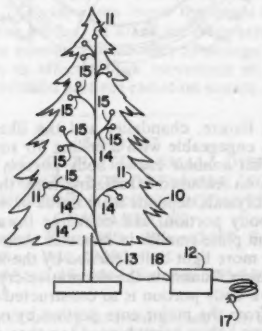
deflect heat but transmit the concentrated light rays; and vent openings in the body.

3,564,232
SHOE HAVING DECORATIVE LIGHTING
Theresa J. Ellerbe, 41 Smith St., Charleston, S.C., and Frank P. Kanapaux III, 1461 Kinglett St., Mount Pleasant, S.C.
Filed Oct. 9, 1968, Ser. No. 766,143
Int. Cl. F21v *33/00*
U.S. Cl. 240—6.4 7 Claims



An illuminated shoe having a detachable heel containing a concealed battery. A fastener for the heel on the body of the shoe serves to limit the movement of an on and off switch arm. The concealed battery powers the illuminating member on the shoe body.

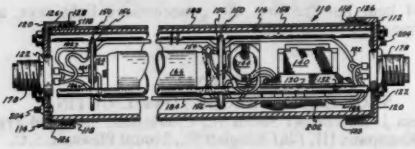
3,564,233
FIBER OPTICS ILLUMINATION SYSTEM
Mason C. Cox, Southbridge; Thomas H. McNamara, Waltham; George E. Prifogle, Newton, and Wilfred P. Bazinet, Jr., Webster, Mass., assignors to Image Optics, Inc., Natick, Mass., a corporation of Massachusetts
Filed Apr. 29, 1968, Ser. No. 724,962
Int. Cl. A47g *33/16*; F21p *1/02*
U.S. Cl. 240—10 8 Claims



An ornamental illumination system for a Christmas tree employs a light source located at the base of the tree, which

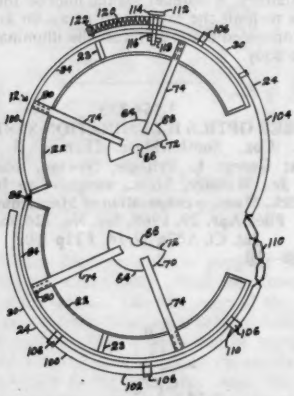
is coupled to a fiber optics harness. The harness distributes light from the source to a plurality of translucent ornamental shapes distributed decoratively about the tree. A color wheel at the light source controls the apparent colors illuminating the ornamental shapes, which shapes themselves may be made of different colors of translucent materials. The resulting displays of colors may be complex.

3,564,234
INTERNAL WORK LIGHT
Graydon A. Phlieger, Jr., 325 McLeod Ave., Cocoa, Fla. 32922
Filed Aug. 5, 1968, Ser. No. 752,729
Int. Cl. H05b 33/04
U.S. Cl. 240—51.11 **3 Claims**



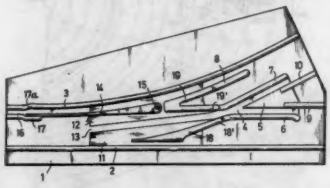
A sealed fluorescent tube light that can be connected to other similar units to form a string of work lights. The tube light locates and seals the ballast and starter inside of its interior so as to provide compactness and safety during use. A radio frequency interference shield is provided around the tube light to prevent the radiation of electrical interference from the electrical components.

3,564,235
ELECTRIC LIGHT FIXTURE CHANDELIER
Solomon I. Nicokiris, 1420 Grand Concourse, Bronx, N.Y.
Filed Aug. 30, 1968, Ser. No.
Int. Cl. F21v 17/06
U.S. Cl. 240—108 **5 Claims**



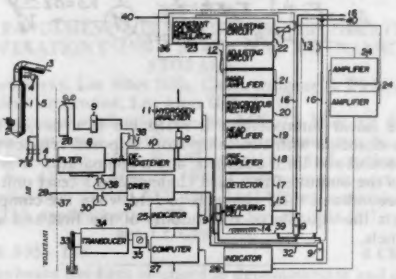
A lighting fixture, chandelier and the like, with a major core portion engageable with a ceiling for suspension of the fixture, and an annular crown body portion carried by the core portion on framework radiating from the core portion. An array of crystals depends from cords or wires secured to the crown body portion, and converge inwardly to engage with a bottom plate smaller in diameter than the crown portion. One or more light bulbs carried by the lower portion of the core portion illuminate the decorative crystals attractively. The crown body portion is so constructed as to be readily disengaged from the major core portion by opening it out in halves, the two halves being hinged together, and there being an annular groove formed in the core portion for releasable engagement with a matching portion of the crown body portion. By thus detaching the crown portion and its crystals from the core portion, the crown and crystals are easily immersed in a bath of washing solution for thorough cleansing.

3,564,236
SWITCH, ESPECIALLY DOUBLE CROSS SWITCH FOR ELECTRIC TOY AND MODEL RAILROAD INSTALLATIONS
Max Ernst, Lohengrinstr. 14, Nurenberg, Germany
Filed Aug. 12, 1968, Ser. No. 751,795
Claims priority, application Germany, Aug. 12, 1967, E34589
Int. Cl. E01b 7/00; A63h 19/32
U.S. Cl. 246—415 **29 Claims**



A switch, especially narrow gauge double cross switch, for electric toy and model railroads, with current supply through both rails, in which in the vicinity of the central portion of the switch, the outer rails of the switch which are connected to the insulated switch bed, are provided with conductive plates which extend closely to the central portion of the switch and which within the switch form electric current conductive surfaces for contact with the wheel rims of rail vehicles passing over the switch and with guiding rails for the wheel rims as well as for the bearings of the switch tongues.

3,564,237
INFRARED AUTOMATIC ANALYZING METHOD FOR BLAST FURNACE GAS
Fusanori Takeuchi, Kawasaki-shi; Ryoichi Ikematsu, Yokohama-shi; Tomohisa Yamamoto, Tokyo; Syozi Honma, Yokohama-shi, and Koji Fukukita, Fukuyama-shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 23, 1967, Ser. No. 625,384
Claims priority, application Japan, Mar. 31, 1966, 41/19745
Int. Cl. G01n 21/26
U.S. Cl. 250—43.5 **1 Claim**

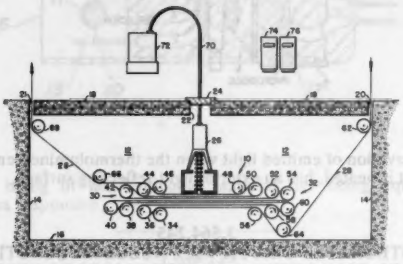


An automatic controlling method for the operation of blast furnace which comprises maintaining the moisture content of sampled blast furnace gas at an exceedingly low and constant level, keeping the infrared gas analyzers for CO and CO_2 in the sample gas at constant temperature, purging, carrying out infrared analysis of the sample gas automatically and continuously under a known atmospheric pressure, correcting automatically the values of the analysis to those at the standard atmospheric pressure, and sending the signals obtained from the corrected values of the analysis to a computer.

3,564,238
IRRADIATION APPARATUS IN COMBINATION WEB HANDLING MEANS

William J. Martin and Charles R. Ruppe, Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed May 8, 1967, Ser. No. 636,708
Int. Cl. G21f 7/00
U.S. Cl. 250—49.5 10 Claims

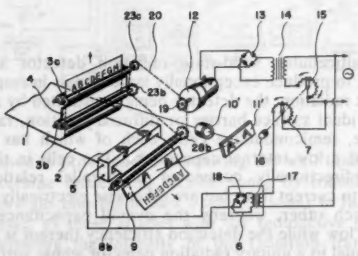


A system for continuously irradiating chemically treated material which employs an improved arrangement for permitting multiple passes of the treated material through the irradiation field while the distance between the layers of treated material passing through the field is maintained to improve the efficiency of the irradiation process. Ionizing irradiation apparatus is also included.

3,564,239
FLOW-TYPE PHOTOELECTRIC DUPLICATING MACHINE HAVING MEANS FOR CHANGING THE CORONA VOLTAGE IN ACCORDANCE WITH THE PAPER SPEED

Teizo Kushima, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1968, Ser. No. 756,536
Int. Cl. G03g 13/00
U.S. Cl. 250—49.5 1 Claim

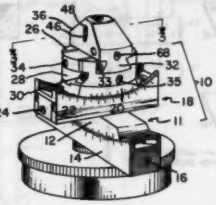


In a flow-type photoelectric duplicating machine in which the original to be duplicated and the photosensitive paper are positioned in such a way as to be optically interrelated and connected by the optically connecting optical system, for which purpose the original that is illuminated by the illuminating device is gradually sent from one end to the other across the light path of the said optical system, while synchronously the photosensitive paper is sent, after having been gradually sent from one end to the other through the electrostatic charging device, across the light path of the said optical system, so that the image of the original is gradually duplicated from one end to the other on the photosensitive paper; in such a flow-type photoelectric duplicating machine, an electric and/or mechanical connection is established between the passage speed of the photosensitive paper and the terminal voltage of the electrostatic charging device so that the one increases when the other increases and the one decreases when the other decreases.

3,564,240
GONIOMETER HEAD FOR X-RAY DIFFRACTION APPARATUS WITH IMPROVED Z-MOTION MECHANISM

Roy Leander Thomas, Jr., Medway, Mass., assignor to Charles Supper Co., Inc., Natick, Mass.

Filed July 22, 1969, Ser. No. 843,541
Int. Cl. G01n 23/20
U.S. Cl. 250—51.5 11 Claims

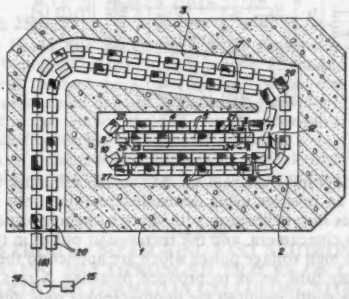


This disclosure depicts a goniometer head for securing and positioning a crystal specimen in X-ray diffraction apparatus. The disclosure stresses a lockable variable friction drive Z-axis translation mechanism for the head.

3,564,241
IRRADIATION APPARATUS

Alfred Ludwig, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Apr. 9, 1968, Ser. No. 719,863
Claims priority, application Switzerland, May 3, 1967, 6310/67
Int. Cl. G01t 7/08
U.S. Cl. 250—52 8 Claims



The continuous track has individual parallel track sections which are connected together by loops to form a single path for the loads. The conveyors move the loads by means of catches along the track. The loads are transferred at various points from one conveyor to another to change the speed of the loads so as to effect a slow movement of the loads in closely spaced relation past the radiation source.

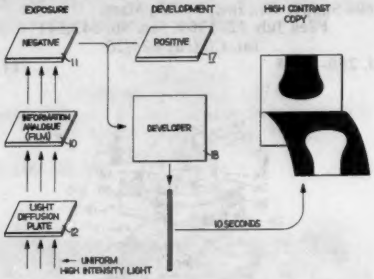
3,564,242
METHOD OF ACCENTUATING SMALL DIFFERENCES IN OPTICAL DENSITY FOR OBTAINING ISODENSITY SHAPES WHICH WILL PROVIDE QUANTITATIVE COMPARISONS

Charles Lescrenier, West Allis, Wis. (2209 E. Kenilworth Place, Milwaukee, Wis. 53202)

Filed Sept. 30, 1966, Ser. No. 583,267
U.S. Cl. 250—65 10 Claims

A method for obtaining isodensity lines from a continuous tone film which makes small differences in optical density discernible comprises exposing a negative photocopy emulsion to high intensity diffuse light of at least 800 foot candles through the film for a predetermined time, placing a positive

emulsion in contact with the exposed negative, inserting them in a developing solution, removing them and separating them after a predetermined time, whereby all optical densities below a selected density, determined by the light exposure time, are erased from the positive and the image thereon is an isodensity outline of the image on the film in which lines of slightly varying density can be easily distinguished.

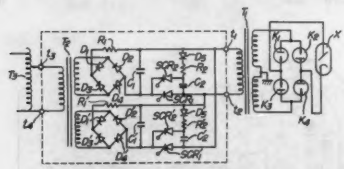


3,564,243

POWER SUPPLY CIRCUIT FOR USE WITH X-RAY GENERATING DEVICE FOR CINE-RADIOGRAPHY

Yoshito Takao, Nagasaki-shi; Haruyuki Kusagaya, Koganeishi; Shigenobu Yanaka, Tokyo, and Kouichi Koike, Funabashi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1968, Ser. No. 710,227
Int. Cl. H05g *1/14, 1/60*
U.S. Cl. 250—65 **8 Claims**



Cineradiography wherein an AC sinusoidal input is converted by an inverter using controlled rectifiers into rectangular pulses in synchronism with shutter opening signals provided by a cinecamera, and the rectangular pulses in turn are boosted to high voltage pulses which are applied to the anode of an X-ray tube so as to produce pulselike X-rays of optional time-width required for photographing only during the period when the shutter is opened, thereby minimizing the dosage to which a patient is exposed. Thus, the device described herein is advantageous over the conventional devices in which pulse-like X-rays are generated under the control of the grid of an X-ray tube, in that the former can be constructed at lower cost, and that high-speed cinephotography can be carried out since the number of frames per second can be selected irrespective of the frequency of the power source.

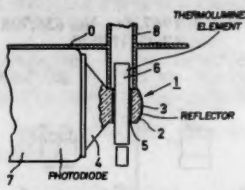
3,564,244

MEASURING DEVICE FOR THERMOLUMINESCENT DOSIMETRY INCLUDING A DIFFUSELY REFLECTING BODY

Raymond Schayes, Brussel; Lucien Kersten, Dilbeek, and Claude Brooke, Ukkel, Belgium, assignors to Manufacture Belge De Lampes et De Material Electronique en Abrege M.B.L.E., Brussel, Belgium

Filed Sept. 13, 1966, Ser. No. 579,129
Claims priority, application Belgium, Sept. 16, 1965, 17,982
Int. Cl. G01t *1/11*
U.S. Cl. 250—71 **2 Claims**

A device for measuring the light emitted by a thermoluminescent element when heated including a body of material transparent to light which, except for a wall portion for the observation of emitted light when the thermoluminescent element is heated, has an exterior light-reflecting surface.

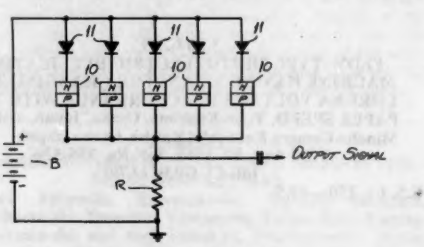


3,564,245

INTEGRATED CIRCUIT MULTICELL P-N JUNCTION RADIATION DETECTORS WITH DIODES TO REDUCE CAPACITANCE OF NETWORKS

Dale R. Koehler, River Vale, N.J., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed Jan. 24, 1968, Ser. No. 700,102
Int. Cl. H01p *15/06*
U.S. Cl. 250—83 **12 Claims**



A multicellular, solid-state radiation detector assembly adapted to produce exceptionally large signals in response to incident radiation, the detector being constituted by an array of individual surface-barrier or diffused-junction, radiation-sensitive, semiconductive cells, each of which has a small area and a low internal capacitance. The cells in the array are unidirectionally connected in parallel relation with respect to current flow, but are otherwise electrically isolated from each other, whereby the overall capacitance of the array is low while the detection efficiency thereof is substantially equal to a unitary radiation detector whose surface area is equivalent to the aggregate area of the cells, the signal output from the multicellular detector being far greater than that yielded by the unitary detector.

3,564,246

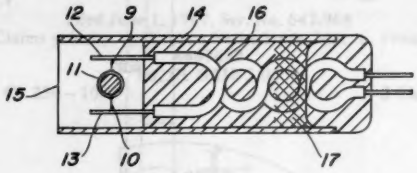
GAMMA COMPENSATED FISSION THERMOCOUPLE

Roderick Gordon Morrison, Los Alamos, N. Mex., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 5, 1965, Ser. No. 477,627
Int. Cl. G01t *3/04*
U.S. Cl. 250—83.1 **3 Claims**

A neutron flux measuring apparatus being the combination of a first and a second thermocouple connected in series in polarity opposition and each comprising an identical pair of dissimilar leads and a middle metallic spherical body having a diameter equal substantially to the mean free path of a thermal neutron in the uranium isotope, the neutron flux of

which is being measured, one of the middle metallic bodies being of fissionable material and the other middle metallic body being of nonfissionable material but being equally gamma responsive.



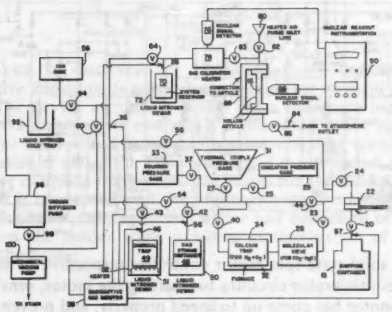
3,564,247

METHOD FOR MEASURING WALL THICKNESS OF ARTICLES USING GASEOUS RADIOACTIVE MATERIAL

Louis L. Packer, Hazardville, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 16, 1966, Ser. No. 558,065

U.S. Cl. 250—83.3 6 Claims



A method is provided for measuring the wall thickness of hollow turbine blades and turbine vanes by transferring a radioactive gas into the hollow blades or vanes to fill the interior cavity of these articles with the radioactive gas, and then measuring the intensity of the radiation transmitted through the wall of the hollow blade or vane, the intensity of this radiation providing an indication of the thickness of the wall.

3,564,248

METHOD AND APPARATUS FOR CALIBRATING PULSED NEUTRON WELL LOGGING INSTRUMENT

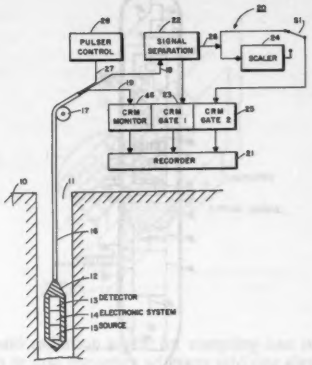
Eric C. Hopkinson and Arthur H. Youmans, Harris County, Tex., assignors to Dresser Industries, Inc., Dallas, Tex., a corporation of Delaware

Filed Nov. 29, 1967, Ser. No. 686,397

Int. Cl. G01v *5/00*

U.S. Cl. 250—83.3 8 Claims

A well logging instrument having a pair of radiation detector circuits and a pulsed neutron source are coupled through a cable to the surface electronics and calibration controls. A first switch is provided at the surface for causing the neutron source to operate continuously and a second switch is provided to effect a change in the gain of one of the radiation detector circuits, thus providing means for comparison of the sensitivities of the two detection circuits. An adjustable observation gate in the surface electronics, in conjunction with a digital time interval counter, is used to measure the time elapsed between sync pulses and the beginning and ending of each of the two detection gates.



3,564,249

REVERSE PENETRANT METHOD AND MEANS

Orlando G. Molina, Westminster, Calif., assignor to North American Rockwell Corporation

No Drawing. Filed Feb. 24, 1969, Ser. No. 801,844

Int. Cl. G01n *21/16*

U.S. Cl. 250—71 4 Claims

In a liquid dye penetrant system, conventional daylight visible bleeding dye penetrant is initially applied to a test surface, and cleaned therefrom leaving residual dye penetrant within cracks and defects. A fluorescing developer coating is applied to the test surface and viewed under ultraviolet light, the solid fluorescing background revealing a nonfluorescing pattern of defects which appears as a black trace wherever residual dye penetrant contacts the developer coating.

3,564,250

METHOD OF MEASURING FAST NEUTRONS BY OBSERVING MULTIPRONGED TRACKS OF CHARGED PARTICLES FORMED IN CELLULOSE NITRATE

Paul B. Price and Robert M. Walker, St. Louis, Mo., and Robert L. Fleischer, Schenectady, N.Y., assignors to General Electric Company, a corporation of New York

No Drawings. Filed Jan. 3, 1967, Ser. No. 606,547

Int. Cl. G01t *5/10*

U.S. Cl. 250—83.1 5 Claims

This specification discloses the concept of detecting fast neutrons by chemically drilling or etching out multipronged tracks of charged particles formed in cellulose nitrate test bodies by collisions of fast neutrons with nuclei including those of carbon, nitrogen, oxygen and boron.

3,564,251

CASING INSPECTION METHOD AND APPARATUS

Arthur H. Youmans, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

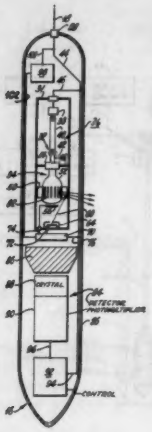
Filed Mar. 4, 1968, Ser. No. 710,303

Int. Cl. G01t *1/16*, *1/20*

U.S. Cl. 250—83.3 12 Claims

Methods and apparatus for the inspection of casing, pipe lines, tanks, or the like are disclosed. The internal surface thereof is scanned with an X-ray beam. The intensity of the

resulting scattered X-rays is measured, displayed and recorded in correlation with the scan as a measure of the



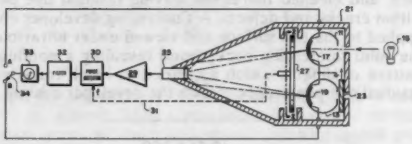
condition of the surface or the thickness of the scanned material.

3,564,252

RADIOMETER FOR MEASURING POWER ON AN ABSOLUTE BASIS

Paul E. Stoft, Menlo Park, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif., a corporation of California

Filed Feb. 26, 1969, Ser. No. 802,338
Int. Cl. G01j *5/10*
U.S. Cl. 250—83.3 **6 Claims**



There are provided two integrating spheres having the same configuration. One of the integrating spheres is heated by incident radiation collected from an outside energy source of unknown power. The second sphere is heated resistively to the same temperature attained by the first sphere. The electrical heating of the second sphere is controlled by a servo loop activated from a single detector which alternately senses thermal radiation from the two spheres. Electrical power delivered to the heating element in the second sphere is measured by a power meter and directly equals the radiative power incident in the first sphere.

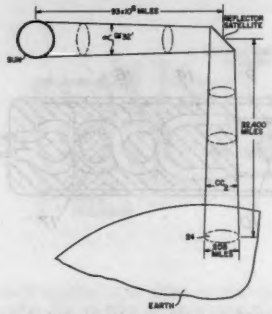
3,564,253

SYSTEM AND METHOD FOR IRRADIATION OF PLANET SURFACE AREAS

Arthur G. Buckingham, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1967, Ser. No. 612,905
Int. Cl. H01j *35/00*
U.S. Cl. 250—85 **1 Claim**

A system and method for generalized irradiation of relatively large surface areas of a planet, such as the earth, the moon, etc. for illumination, heating, weather control, etc., employing one or more planet-orbiting self-erecting planar-reflector satellites controlled in attitude and orbit position to



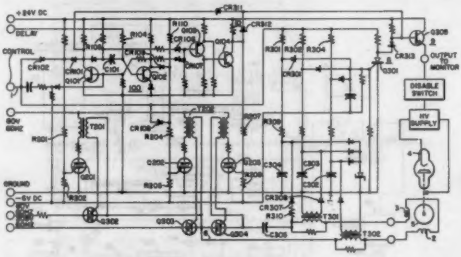
reflect energy from the sun to a desired area on the planet's surface.

3,564,254

SPIN MOTOR CONTROLLER FOR A ROTATING ANODE MOTOR OF AN X-RAY GENERATOR TUBE

Melvin P. Siedband and Jack L. James, Baltimore, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed July 17, 1968, Ser. No. 745,534
Int. Cl. H05g *1/00*
U.S. Cl. 250—93 **19 Claims**



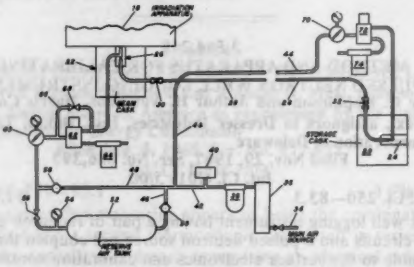
A solid state spin motor controller responsive to monostable multivibrator circuitry for starting the motor, sensing that the motor has come up to speed properly, and preventing the application of excitation to the anode of the X-ray generator tube in the event the motor has not properly come up to speed or fails to operate continuously.

3,564,255

RADIOACTIVE SOURCE CAPSULE-HANDLING SYSTEM

George Robert Massey, Long Beach, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 25, 1967, Ser. No. 641,320
Int. Cl. G21f *5/00*
U.S. Cl. 250—106 **1 Claim**

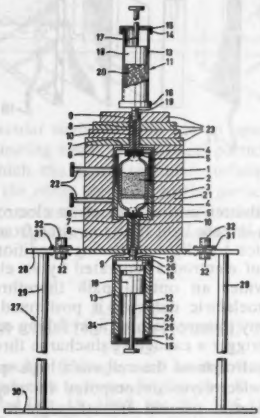


The invention is particularly directed to a capture and sensing system useful in pneumatic transportation of capsules.

3,564,256
RADIOISOTOPE GENERATOR OF THE MOTHER-DAUGHTER TYPE HAVING QUICK-DETACHABLE MEMBERS

Jan Jacob Arlman and Dirk Nonhebel, Amsterdam, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 1, 1967, Ser. No. 642,968
Claims priority, application Netherlands, Mar. 6, 1966, 6607699
Int. Cl. G21h 5/00
U.S. Cl. 250—106 3 Claims



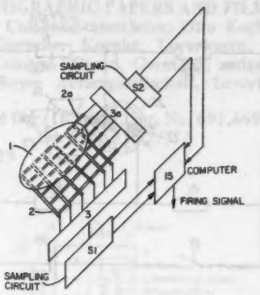
A device is disclosed for obtaining fluids containing radioactive constituents particularly suitable for medical purposes. The device includes a holder for a substance having radioactive constituents and which is providing at the upper and lower ends with a portion of a quick-coupling member. In operation a vessel for a flushing liquid is connected with the upper coupling portion and the vessel for the fluid to be collected is connected with the lower coupling member portion to facilitate washing of the holder and collection of the fluid from the holder while avoiding contamination of the fluid in the holder.

3,564,257
RADIATION DETECTING APPARATUS

Peter John Berry, Itchingwood Common, Limpsfield, Surrey, and Bernard John Thompson, Walton-on-Thames, Surrey, England, assignors to Electric & Musical Industries Limited, Hayes, England

Filed Jan. 31, 1962, Ser. No. 170,280
Claims priority, application Great Britain, Feb. 3, 1961, 4,254/61
Int. Cl. F41g 7/00
U.S. Cl. 250—203 10 Claims

Apparatus for indicating the position of a radiating body moving relative to said apparatus, comprising a first lattice of elongated parallel radiation-sensitive elements, a second lattice of elongated parallel radiation-sensitive elements, means for focusing radiation on said two lattices from substantially the same point of view, the elements of the first lattice being at right angles to the elements of the second lattice from the point of view of the focusing means, first sampling means for sampling the elements of the first lattice in predetermined manner to determine which, if any, of the respective elements receives radiation, second sampling means for sampling the elements of the second lattice independently of the first sampling means in predetermined manner to determine which, if any, of the respective elements receives radiation, and output means responsive to the respective sampling means for producing output signals respectively representing the location of elements of the respective lattices receiving the radiation, wherein either or both of said sampling means comprises sequentially operable means for initially sampling the respective elements in a predetermined sequence, means for discontinuing the sequential operation of said sequentially operable means in response to a radiation signal from one of the respective elements, relocating means responsive to a

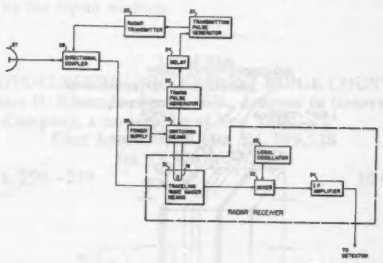


decline of said radiation signal for sampling one or more of the elements in said sequence adjacent said one element until a radiation sensitive signal is obtained from one of said adjacent elements.

3,564,258
MAGNETIC MASER SATURATION PROTECTION SWITCH

Bernard R. Feingold, Pennsauken, N.J., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 8, 1968, Ser. No. 743,192
Int. Cl. H04b 9/00
U.S. Cl. 250—199 7 Claims



The present invention utilizes a switching coil in conjunction with a traveling wave maser means to enable the use of a maser crystal in a radar system. The switching coil is placed within the confines of the wall of the waveguide within which the maser is located and is connected with a power supply that produces a current flow that produces an additional magnetic field. The additional magnetic field detunes the maser for a time period equal to the radio frequency pulse transmitted by the radar system.

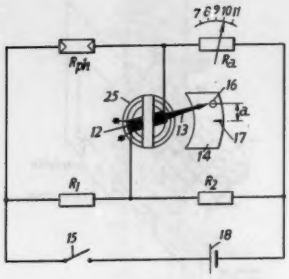
3,564,259
PHOTOELECTRIC EXPOSURE METER WITH OFF-ZERO BALANCING MARK ON METER SCALE

Walter Hennig; Lothar Brust, and Erich Geissler, Dresden, Germany, assignors to VEB Pentacon Dresden Kamera-und Kinowerke, Dresden, Germany

Filed May 27, 1968, Ser. No. 732,391
Int. Cl. H01j 39/12
U.S. Cl. 250—210 5 Claims

A photoelectric exposure-measuring device having a photoconductive cell arranged in a compensation circuit and an optical or electric balancing resistance and a galvanome-

ter indicating the state of balance, the return spring of which seeks to rotate the moving coil into the currentless zero position, wherein an off zero indication mark is provided on the



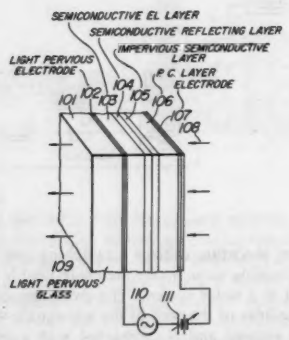
galvanometer to which mark the galvanometer is set to provide an indication of correct exposure factors for prevailing light conditions.

3,564,260

SOLID-STATE ENERGY-RESPONSIVE LUMINESCENT DEVICE

Kazunobu Tanaka, Kawasaki-shi, and Tadao Kohashi, Yokohama, Japan, assignors to Matsuskita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1968, Ser. No. 707,713
Claims priority, application Japan, Feb. 24, 1967, 42/12200
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 **7 Claims**



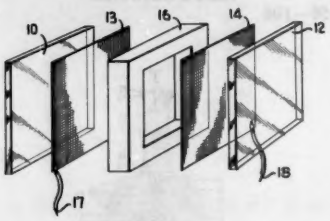
A solid-state energy-responsive luminescent device comprising an electro-luminescent element which is excited by AC voltage and has been endowed with resistivity and a photoconductive element whose photoconductive sensitivity is controlled by superimposing a DC voltage on the AC operating voltage; an AC voltage and a DC voltage superimposed on said AC voltage being applied across said two elements; said device being constituted so that DC voltage distributed to the photoconductive element decreases corresponding to decrease in the resistance of the photoconductive element relating to excitation by incident energy and that the AC photoconductive sensitivity of the photoconductive element is controlled through the DC voltage in response to the intensity of the incident energy.

3,564,261

ELECTROLYTIC LIGHT SCATTERING SHUTTER SYSTEM

Albert F. Hadermann, Ijamsville, Md., and Stephen C. Ban, Fairfax, Va., assignors to Melpar, Inc., Falls Church, Va.

Filed Apr. 1, 1969, Ser. No. 812,181
Int. Cl. G02f *1/30*
U.S. Cl. 250—217 **18 Claims**



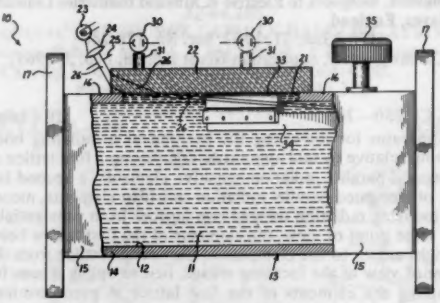
An optical shutter in the form of an electrochemical cell responds to an intense light flash to switch from a light transmitting condition to a light scattering condition. The cell includes a pair of electrodes separated by an electrolyte, and normally provides an optical path therethrough. A fast response photoelectric detector is positioned adjacent the cell to sense any intense flash of light falling on the cell, and thereupon to trigger a capacitive discharge through the electrodes and electrolyte of the cell via a high speed switching circuit. The electrolyte decomposes in response to the passage of electric current therethrough to evolve large quantities of gaseous products which form a film of fine bubbles at the electrodes. The bubbles constitute an irregular reflecting surface effective to scatter incident light. Transparency is resumed upon clearing of the bubbles, which may be accomplished by applying supersonic vibrations to the solution, or by elapse of time.

3,564,262

TURBIDIMETER USING A PRESSURIZED FLUID CONTAINER

Clifford C. Hach, Ames, Iowa, assignor to Hach Chemical Company

Filed Feb. 7, 1968, Ser. No. 703,613
Int. Cl. G01n *21/00, 21/46, 1/00*
U.S. Cl. 250—218 **1 Claim**



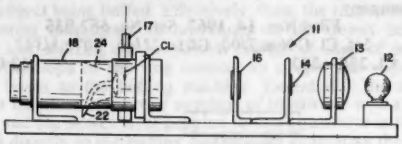
A turbidimeter for fluid under pressure consisting of a pipe section having a thick optical glass window through which light is refracted into the liquid at a very shallow angle. A photocell is positioned to sense light reflected by turbidity particles in the fluid.

3,564,263

OPTICAL PARTICLE SENSOR HAVING A LIGHT COLLECTOR MOUNTED ON THE PHOTOSENSOR

Clyde C. Shaw, Los Altos Hills, Calif., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Sept. 30, 1968, Ser. No. 763,757
Int. Cl. G01n 21/00, 21/26
U.S. Cl. 250—218 9 Claims



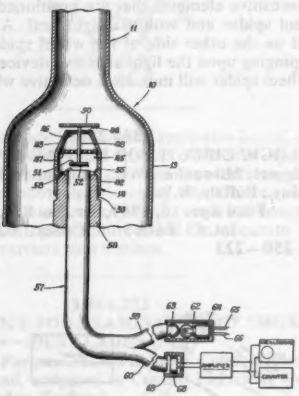
A black specular surfaced tube has an open end aligned with the illuminating beam of an optical particle sensor. The manner in which the black specular surfaced tube is associated with the other elements of the particle sensor permits the tube to act essentially as a black hole for conducting the unscattered light from the illuminating beam out of the particle sensor.

3,564,264

DEVICE FOR COUNTING PARTICLES IN A FLOWING FLUID

Richard F. Karuhn, Chicago, and Anatoli Brushenko, Elmhurst, Ill., assignors to Erdco Engineering Corporation

Filed Dec. 19, 1968, Ser. No. 785,158
Int. Cl. G01n 21/26; G01b 15/00
U.S. Cl. 250—218 15 Claims



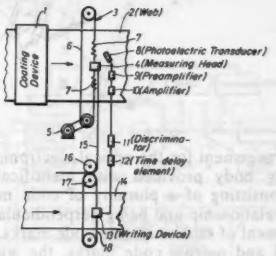
A fluid having the particles to be detected suspended therein is introduced into a tube. The tube has a capillary section through which the flow is laminar in the absence of a particle and which changes to a turbulent flow as a particle traverses the section. Immediately downstream of the section is a flow characteristic detector to indicate whether the flow is laminar or turbulent. In one embodiment the detector is a vane which is pushed sideways by the laminar flow exiting from the section to open an electrical switch and which returns to switch closed position in the presence of turbulent flow. In a second embodiment the detector is a vane which is moved away from the capillary section by laminar flow but which returns toward the section in the presence of turbulent flow. The position of the latter vane is determined by reflecting light angularly therefrom toward a light receiving position with the light present at the receiving position being measured with the measurement being a function of the vane position.

3,564,265

APPARATUS FOR DETECTING AND LOCATING STREAKS ON MOVING WEBS IN THE PRODUCTION OF PHOTOGRAPHIC PAPERS AND FILMS

Konrad Bunge, Cologne-Stammheim; Otto Koch; Bernhard Vinzelberg; Guenther Koepke, Leverkusen, and Georg Braeuniger, Cologne-Flittard, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 18, 1967, Ser. No. 691,469
Int. Cl. G01n 21/32
U.S. Cl. 250—219 7 Claims



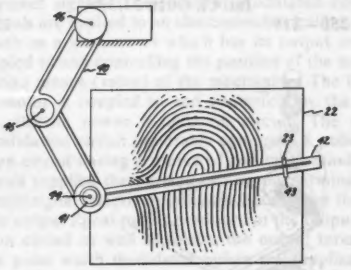
In the production of supported films wherein a liquid medium is deposited on a light reflecting support, the steps of inspecting to determine irregularities in the supported film which comprise directing a light beam to the deposited liquid medium including light of a wave length absorbed by the deposited liquid medium, for reflection by the light reflecting support, and sensing variation is absorption of said light beam by the liquid medium.

3,564,266

PHOTOELECTRIC FINGERPRINT RIDGE COUNTER

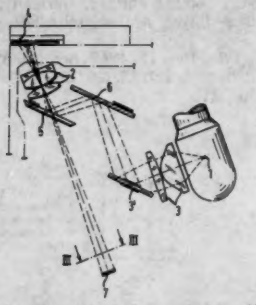
Theodore H. Klotz, Jr., Scotia, N.Y., assignor to General Electric Company, a corporation of New York

Filed Apr. 8, 1968, Ser. No. 719,528
Int. Cl. G01n 21/30
U.S. Cl. 250—219 10 Claims



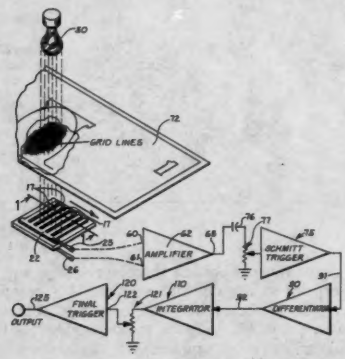
Counting of ridges between the central core and the delta of a fingerprint as an identification aid is accomplished by moving a photodetector between a pair of selected points across a rear-projected image of the print. The photodetector output signal drives a counter for each crossing of the photodetector light intensity reference level in a given direction, so as to indicate the number of ridges. Photodetector-positioning apparatus is provided to reduce operator fatigue and insure accuracy.

3,564,267
ARRANGEMENT FOR OPTICAL-ELECTRONIC IDENTIFICATION OF A MOVING BODY
Arthur Walter, Denzlingen, Germany, assignor to Erwin Sick, Waldkirch, Breisgau, Germany
Filed Apr. 23, 1969, Ser. No. 818,619
Claims priority, application Germany, Apr. 26, 1968, P 17 74 180
Int. Cl. G08c 9/06
U.S. Cl. 250—219 6 Claims



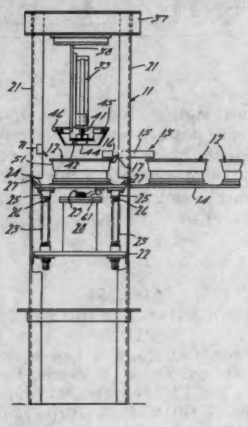
An arrangement for the optical-electronic identification of a moving body provided with identification marks, said marks consisting of a plurality of code marks arranged in parallel relationship and being perpendicular to the direction of movement of said body, said code marks being constituted as broad and narrow code marks, the width of the broad code marks being three times that of the narrow code marks and the space on both sides of a narrow code mark being at least twice the width of a narrow code mark. An optical system is provided for producing a scanning spot of light of at least four times the width of a narrow code mark, the optical system projecting the images of the respective illuminated areas of the field of the identification marks onto four adjacent photodetectors controlling two gates via three differential amplifiers responsive to the difference of the scanning signal of the fourth, outer detector with respect to the scanning signals of the remaining three detectors, one of the gates being responsive to a broad mark while the other of the gates is responsive to a narrow mark.

3,564,268
DOCUMENT VERIFIER USING PHOTOVOLTAIC CELL WITH LIGHT SENSITIVE BARS
Robert T. Bayne, and James S. Nawa, Santa Barbara, Calif., assignors to Standard Change-Makers, Inc., Indianapolis, Ind.
Filed June 27, 1969, Ser. No. 837,060
Int. Cl. G01n 21/32
U.S. Cl. 250—219 12 Claims



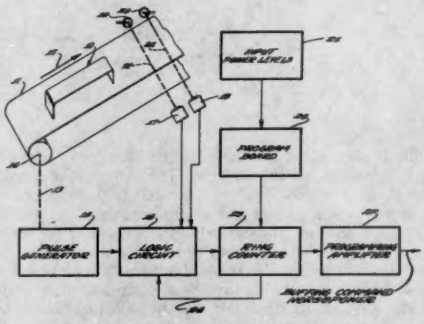
A dollar bill verifier including a photovoltaic cell having light sensitive bars approximately the same width as the black grid lines on the bill. An amplifier receives the output of the cell and couples it through a potentiometer to a Schmitt trigger. The Schmitt trigger is coupled through a differentiator, integrator and potentiometer to a switch.

3,564,269
METHOD AND APPARATUS FOR PHOTOSENSITIVELY TESTING WHEELS
Alvah J. Lynch, Wayne, Mich., assignor to Kelsey-Hayes Company
Filed Nov. 14, 1967, Ser. No. 682,935
Int. Cl. G06m 7/00; G01n 21/16; B07c 5/342
U.S. Cl. 250—223 12 Claims



An apparatus for detecting cracks in the spider of a vehicular wheel. The detecting apparatus employs a plurality of light-sensitive elements that are positioned on one side of the wheel spider and within a light seal. A light source is disposed on the other side of the wheel spider whereby any light impinging upon the light-sensitive device through cracks in the wheel spider will indicate a defective wheel.

3,564,270
LOGIC CIRCUIT FOR BUFFING MACHINE
Glenn Eggert, Milwaukee, Wis., assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed Apr. 16, 1969, Ser. No. 816,717
Int. Cl. B60s 3/00; C06m 3/02
U.S. Cl. 250—223 17 Claims



An automatic system for buffing a moving object which includes means for developing a series of pulses in response to the rate of movement of the object to be buffed and for utilizing the pulses so developed to sequentially apply a predetermined buffing force to the moving object. A solid-

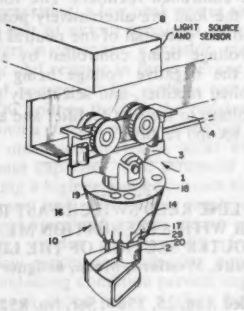
state logic circuit is employed to control the operation of a solid-state counter. The counter in turn utilizes each count for coupling a power level to the buffing machine so that a given power level is related to each pulse through the counter. Hence, a given power level is related to each increment of movement of the object being buffed. A series of gate circuits sense the presence of the object to be buffed and sets a ring counter. When the object to be buffed is sensed by the logic circuit, the ring counter is opened to a pulse generator which is sequenced to the rate of movement of the object being buffed. Effectively, then, the ring counter is counting increments of movement of the object being buffed and utilizing the sequential change of state of individual flip-flops of the ring counter to couple the various power levels to the buffing machine. Essentially, the ring counter biases on respective numbers of transistors with each count, and the power level coupled to each transistor is then applied directly to the buffing machine for generating the instantaneous force required to buff the moving object.

3,564,271

CONVEYOR CODING APPARATUS

Richard E. Nearman, Mount Airy, Md., assignor to Automated Handling Systems Inc., Washington, D.C.

Filed May 13, 1968, Ser. No. 728,514
Int. Cl. G06m *7/00*
U.S. Cl. 250—223 **8 Claims**



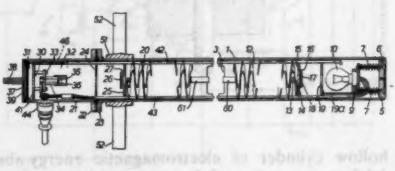
Described herein are light coding apparatus having moveable cones and plates with upward reflective spots and horizontal visual indicia for use with conventional focused light sources and photoelectric cells, which have particular application to the conveyor art where accurate designations of instructions for operations depend on accurate carrier identification as carriers pass stations.

3,564,272

OPTICAL DEVICE FOR EXAMINATION OF SMOKE OR DUST LADEN GAS

Edmund James Payton, Tadworth, and Colin Wilson, New Malden, England, assignors to Central Electricity Generating Board, London, England

Filed July 9, 1968, Ser. No. 743,522
Claims priority, application Great Britain, July 11, 1967, 31,798/67
Int. Cl. G01n *21/12*
U.S. Cl. 250—218 **13 Claims**



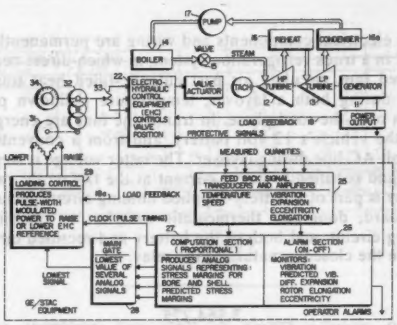
An optical device for examination of smoke- or dust-laden gases such as flue gas from a furnace. The device comprises a tube with a lamp at one end and a photocell at the other end and diametrically opposite slots in the tube to allow the gas to be examined to pass between the lamp and the photocell. Means are provided to ensure that there is a flow of air away from each end of the tube towards the slots to prevent dust from the gas reaching the lamp and photocell.

3,564,273

PULSE WIDTH MODULATED CONTROL SYSTEM WITH EXTERNAL FEEDBACK AND MECHANICAL MEMORY

William D. Cockrell, Waynesboro, Va., assignor to General Electric Company, a corporation of New York

Filed Nov. 9, 1967, Ser. No. 681,819
Int. Cl. F01d *17/00*
U.S. Cl. 290—40 **22 Claims**

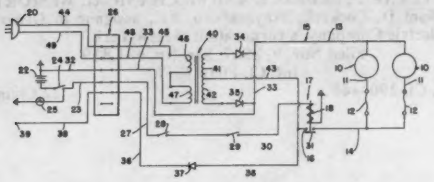


This invention comprises a control system for electrically controlled, mechanically actuated mechanisms of large power rating. Such mechanisms normally include mechanical actuating devices such as control valves for controlling the output operating condition of the mechanism. The control system of the invention includes electric power modulation circuit means having its input coupled to a source of electric control signals for controlling the operation of the mechanism and for producing output modulated controlled electric power signals. These output modulated controlled power signals are applied to an electromechanical positioning device such as a servomotor which has its output mechanically coupled to and controlling the position of the mechanical actuating means (valve) of the mechanism. The input of the servomotor is coupled to and controlled by the output from the electric power modulation circuit. The electric power modulation circuit preferably comprises a pulse width modulation circuit having a source of constant period pulsed clock signals supplied thereto and two output terminals. The input control signal selectively controls the width at the clock rate of the output signal pulses produced at the output of the modulation circuit as well as selects the output terminal to which the pulse width modulated pulses are supplied. As a result, the pulse width modulated output signals from one output terminal will serve to adjust the servomotor in one direction while the signals from the remaining output terminal serve to adjust the servomotor in the other direction. By reason of this arrangement, the last adjusted position of the mechanical actuating means by the servomotor serves as a memory for the overall control system until the next adjustment of the operating condition by the control system. The control system of the invention is particularly intended for use with turbine-generator sets and for controlling the startup and initial loading of the turbine-generator set until such time that it has attained its optimum operating condition.

3,564,274
ELECTRICAL CIRCUITRY FOR VEHICULAR REFRIGERATING SYSTEMS

Kenneth L. Kaltz, Lansing, Mich., assignor to Tranter Manufacturing, Inc., Lansing, Mich.

Filed Dec. 4, 1968, Ser. No. 780,975
Int. Cl. H02g 3/00
U.S. Cl. 307—10 17 Claims

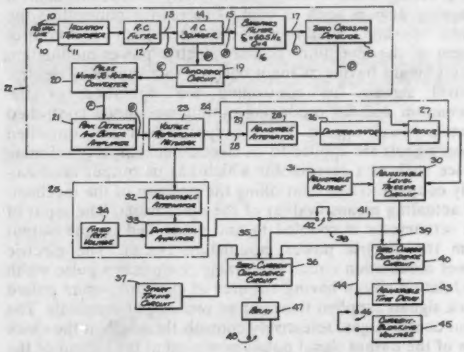


The electrical components and wiring are permanently installed in a truck refrigeration system, in which direct current powered fans circulate air past eutectic-filled heat transfer plates during both a layover, temperature pulldown phase and an over-the-road phase. In transit the fans are energized from the vehicle's 12 volt battery, and from a conventional 220 volt AC line during layover. The latter voltage is stepped down and rectified to direct current at the fan motor rating. A relay is part of a battery-supplied holding circuit including dashboard, door and thermostatic switches to establish a holding circuit; and both of the battery and rectified circuits include the closed armature of the relay.

3,564,275
FREQUENCY-RESPONSIVE CONTROL CIRCUIT

Edwin R. Eberle, Great Neck, and Charles J. Durkin, Jr., Yorktown Heights, N.Y., assignors to Consolidated Edison Company of New York, Inc., New York, N.Y.

Filed May 22, 1969, Ser. No. 826,844
Int. Cl. H02j 3/00
U.S. Cl. 307—29 19 Claims

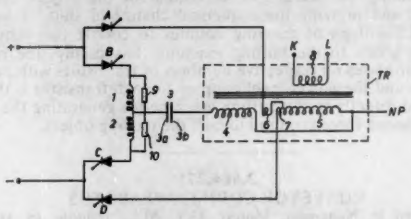


Phase shift caused by a band-pass filter is employed for providing a voltage proportional to the deviation in frequency of an input signal from a reference level. This arrangement is incorporated in a relay control circuit for an electric power network load shedding system which includes an adjustable level trigger circuit for establishing the flat tripping frequency, an adjustable differential amplifier circuit for establishing an inhibit frequency, and a rate circuit for advancing the tripping frequency as a function of the rate at which system frequent drops. An adjustable time delay circuit prevents the relay from operating in response to transients.

3,564,276
APPARATUS FOR GENERATING PULSATING CURRENTS OF HIGH AMPERAGE

Jack Van Eijnsbergen, 124 E. Hickory Grove Road, Bloomfield Hills, Mich.

Continuation-in-part of application Ser. No. 420,412, Dec. 22, 1964, now abandoned. This application Sept. 25, 1968, Ser. No. 768,606
Int. Cl. H02m 7/52
U.S. Cl. 307—106 4 Claims

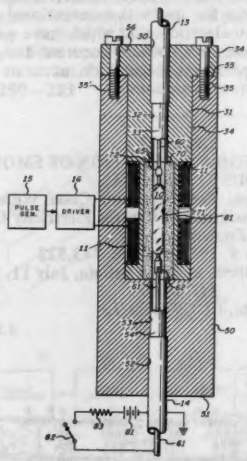


An apparatus for generating pulsating currents of high amperage with adjustable pulse spacing and pulse duration which utilizes a load in a circuit having an input and neutral leads and two controlled rectifiers. The voltages fed to the input lead of the load are alternatively positive or negative with respect to the potential of the neutral lead of the load, the positive voltage being controlled by a first controlled rectifier and the negative voltage being controlled by a second controlled rectifier, and selectively applying a negative reverse voltage to the first rectifier and a positive reverse voltage to the second rectifier.

3,564,277
COAXIAL LINE REED SWITCH FAST RISE SIGNAL GENERATOR WITH ATTENUATION MEANS FORMING OUTER SECTION OF THE LINE

Hugh C. Maguire, Westford, Mass., assignor to Sperry Rand Corporation

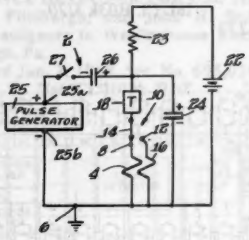
Filed Aug. 25, 1969, Ser. No. 852,656
Int. Cl. H01p 1/22; H03k 3/66; H01h 9/00
U.S. Cl. 307—106 8 Claims



A hollow cylinder of electromagnetic energy-absorbing material forms a portion of the outer conductor of a coaxial transmission line, the portion encompassing a mercury-wetted, magnetic field operated, reed switch that joins center conductor portions of input and output coaxial lines. When

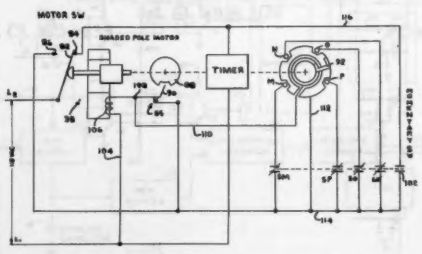
actuated by an externally generated magnetic field, the reed switch is operated to cause a relatively undistorted, sharp voltage step signal to flow along the output coaxial line.

3,564,278
SQUIB CONTROL CIRCUIT
Lionel Robbins, Orchard Lake, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.
Filed Dec. 27, 1968, Ser. No. 787,509
Int. Cl. H03k 3/00
U.S. Cl. 307—108 **2 Claims**



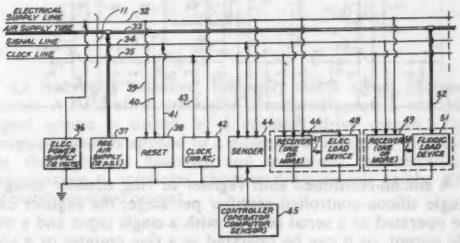
A squib control circuit for feeding a high power current pulse to a load comprising: a low peak power source of a DC voltage having a pair of output terminals across which said DC voltage appears, a capacitor, a resistor, means connecting said capacitor and resistor in series between said output terminals of said source of DC voltage so the capacitor charges to said DC voltage through the resistor, a squib element through which a current pulse is to be fed, self-resetting threshold switch means connected in series with said squib element across said capacitor, said threshold switch means normally presenting a high resistance current blocking condition and wherein said high resistance in response to a voltage applied across said threshold switch means above a given threshold voltage value substantially instantaneously decreases to a low resistance conducting condition, which low resistance conducting condition persists until the current flowing therethrough drops below a given holding current level, and a relatively low power voltage pulse source for triggering said threshold switch device from said high resistance blocking condition to said low resistance conducting condition, said capacitor then discharging to feed a high power current pulse through the squib element.

3,564,279
TIMER
Donald M. Strathearn, Arlington Heights, James M. Thornbery, Morton Grove, and Dale F. Willcox, Aurora, Ill., assignors to Controls Company of America, Melrose Park, Ill.
Original application Mar. 16, 1959, Ser. No. 799,780, now Patent No. 2,995,143, dated Aug. 8, 1961. Divided and this application Sept. 14, 1960, Ser. No. 055,899
Int. Cl. H01h 43/12
U.S. Cl. 307—141 **22 Claims**



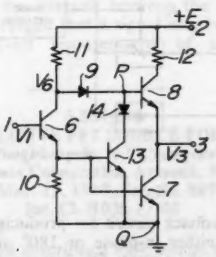
The combination with a timer of the type having a motor for driving, a switch operating cam bank at timing speed through a transmission, of means for driving the cam bank to a preselected starting position comprising, a second motor for driving the cam bank through said transmission, means responsive to energization of the second motor to deenergize the first motor and responsive to deenergization of the second motor to energize the first motor, and clutch means operative upon deenergization of the second motor to disengage the second motor from the transmission to thereby remove the inertia of the second motor from the transmission.

3,564,280
PLEX-PATH CIRCUMFERENTIAL ENERGY CONTROL AND DISTRIBUTION SYSTEM
Peter W. Sognefest, Glenshaw; Ralph G. Nedbal, Pittsburgh, and Bay E. Estes III, Murrysville, Pa., assignors to Essex International, Inc., a corporation of Michigan
Filed Feb. 14, 1969, Ser. No. 799,406
Int. Cl. H02g 3/00
U.S. Cl. 307—155 **8 Claims**



The invention comprises an electrical-fluidic control system adapted to control essentially every function of a vehicle. In a preferred embodiment, the invention comprises a single harness formed of electrical and fluidic transmission paths, respectively connected to sources of electrical and fluid power, control means for applying coded control signals to an electrical signal transmission path, and receiving means connected to the electrical signal and power transmission paths for receiving said coded electrical signals to selectively activate electrical and fluidic switching means to operate desired load devices for performing selected vehicle functions.

3,564,281
HIGH SPEED LOGIC CIRCUITS AND METHOD OF CONSTRUCTING THE SAME
Mitio Tokunaga, Mitsuru Kawanami, and Susumu Aikyo, Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan, a corporation of Japan
Filed Dec. 12, 1967, Ser. No. 689,893
Claims priority, application Japan, Dec. 23, 1966, 41/83893;42/6066
Int. Cl. H03k 19/40
U.S. Cl. 307—214 **11 Claims**



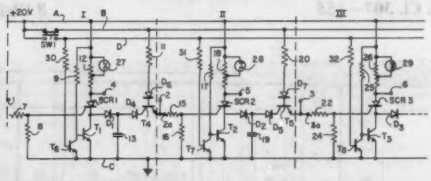
A logic inverter having a transistor emitter follower output circuit and an input circuit including therein a multicollector

transistor or two transistors whose bases and emitters are connected in parallel with each other. In the inverter, the two collectors of the multicollector transistor or of the two transistors in the input circuit are connected to the base and the emitter, which is the output terminal, of the emitter follower transistor, respectively. A plurality of such inverters are combined in such a manner that the bases and the output terminals of the emitter follower transistors are connected in multiple to provide a logic circuit.

3,564,282
SILICON-CONTROLLED RECTIFIER SHIFT REGISTER AND RING COUNTER

Walter H. Vogelsberg, Radnor, Pa., assignor to General Mold and Machinery Corporation, Millville, N.J.

Filed Apr. 1, 1969, Ser. No. 812,253
Int. Cl. H03k *21/00;* **H01h** *47/32*
U.S. Cl. 307—221 **45 Claims**

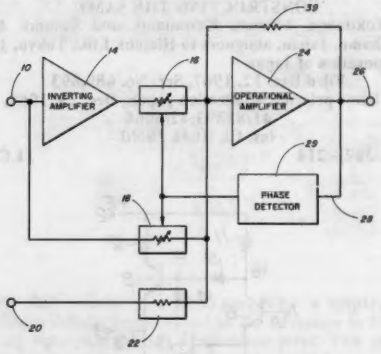


A silicon-controlled shift register or ring counter using a single silicon-controlled rectifier per stage; the register can be operated as a serial register with a single input and a single output, or it can be operated as a ring counter or a plurality of inputs and outputs can be provided; also the output from any stage can be canceled; the shifting from one stage to the next is a positive shift; a special output stage to be used with the register is also disclosed; the register is particularly adaptable to machine control and to the control of industrial processes.

3,564,283
ANALOG FEEDBACK CIRCUIT

Thomas H. Bladen, Adelphi, Md., assignor to the United States of America as represented by the Secretary of the Navy

Filed Sept. 25, 1968, Ser. No. 762,664
Int. Cl. G06g *7/14*
U.S. Cl. 307—229 **8 Claims**

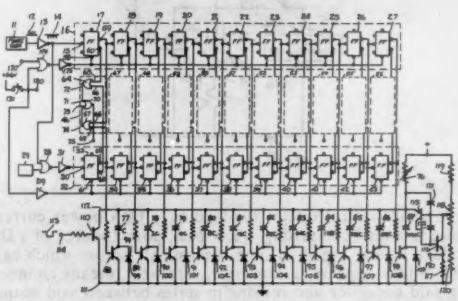


An analog feedback circuit for producing a null or zero output for two either in-phase or 180° out-of-phase input signals applied to the circuit. The first input signal is applied to a first field-effect-transistor variable summing impedance circuit and an inversion thereof is simultaneously applied to a second and complimentary field-effect-transistor variable summing impedance circuit. The second input signal is applied to a third field-effect-transistor constant summing impedance circuit. The outputs of the first and second variable summing impedance circuits are controlled by a DC signal so that when combined with the output of the constant third summing impedance circuit in an operational summing amplifier a null or zero output is obtained.

3,564,284
TIME INTERVAL COMPARISON SYSTEM

Bruce H. Kamens, 56 Hotchkiss Ave., Thomaston, Conn. 067787

Filed Feb. 14, 1969, Ser. No. 799,368
Int. Cl. H03k *5/20*
U.S. Cl. 307—232 **11 Claims**

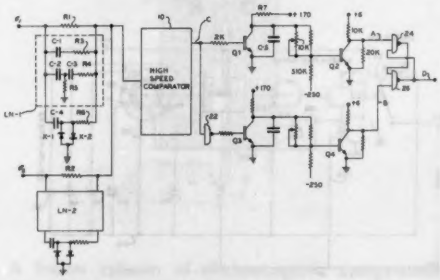


Apparatus for comparing a recorded, standard interval of time with subsequent intervals of time and determining whether such subsequent intervals are equal to the standard interval to within a predetermined degree of accuracy measured as a fraction of the standard interval. The invention includes means to record a standard interval of time as an electrical condition, means to record a subsequent interval of time as a second electrical condition, and time-controlled means to compare the two conditions to determine which is the longer and by how much. One embodiment of the invention includes a timing circuit with a digitally controlled time constant to indicate the discrepancy between a subsequent interval and the standard interval for different standard intervals. Another embodiment uses an additional time recorder to make a direct comparison between the record of the standard interval and a record of the discrepancy interval.

3,564,285
ELECTRONIC COMPARATOR CIRCUIT

Edward O. Gilbert, Ann Arbor, Mich., assignor to Reliance Electric Company, Cleveland, Ohio

Filed May 6, 1968, Ser. No. 726,962
Int. Cl. H03k *5/20*
U.S. Cl. 307—234 **6 Claims**



A noise-rejecting analogue computer comparison circuit in which logic output signals of a high-speed comparator which

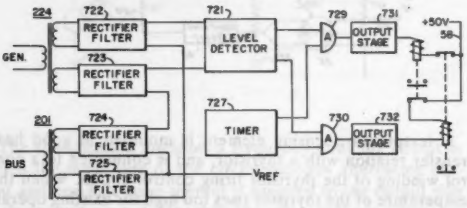
responds to narrow noise spikes is applied directly and in inverted form to a pair of unidirectionally-acting delay circuits, each of which respond only to pulses of a predetermined time-width or greater, but which reset substantially instantaneously, with the outputs of the delay circuits applied to a set-clear flip-flop to provide a logic output signal. Lead networks inserted in the comparator input circuits compensate for the delay provided by the delay circuits, to provide a noise-rejecting comparator which has very little delay for smoothly-varying input signals.

3,564,286

SOLID STATE VOLTAGE MATCHER AND VOLTAGE DIFFERENCE DETECTOR FOR USE THEREIN

Tibor Rubner, Pittsburgh, and John H. Bednarek, Murrysville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 2, 1968, Ser. No. 695,026
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **7 Claims**



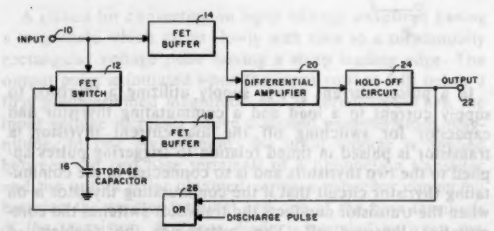
Two direct current difference voltages, of opposite polarity, are obtained, one by subtracting a voltage corresponding to the bus from a voltage corresponding to the generator, and the other by subtracting a voltage corresponding to the generator from a voltage corresponding to the bus, and are applied to the bases of separate transistors both of which, together with a third transistor, comprise a two-input-level detector. If the bus voltage is greater than the generator voltage by an amount which is greater than an adjustable threshold level established by varying the setting of a potentiometer arm connected to the base of the third transistor, an output is applied to a first AND circuit. If the generator voltage is greater than the bus voltage by an amount which is greater than the threshold level, an output is applied to a second AND circuit. A timer connected to both AND circuits supplies a pulse of adjustable width and predetermined repetition rate to both AND circuits simultaneously; the AND circuit which has an additional input thereto in accordance with the relative magnitudes of the bus and generator voltages supplies a pulse signal to an output transistor which energizes a relay winding. The two output transistors supplied from the two AND circuits respectively energize relay windings to supply "raise volts" and "lower volts" pulses to a motor-driven voltage-adjusting rheostat operatively connected to the generator.

3,564,287

MAXIMUM SEEKING ZERO ORDER HOLD CIRCUIT

Barry S. Todd, Corona, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 25, 1968, Ser. No. 747,604
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **2 Claims**



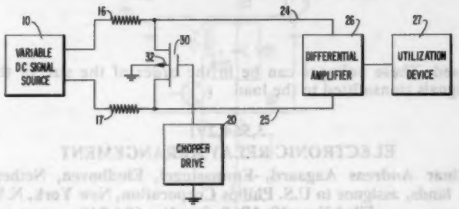
A circuit for finding the maximum value of an input signal and providing an output signal at the time the maximum occurred. The input signal is connected to a memory capacitor each time a differential amplifier determines that the input signal exceeds the stored value.

3,564,288

INHERENTLY BALANCED CHOPPER CIRCUIT

Douglas M. Bauer, Danvers, Mass., assignor to General Electric Company, a corporation of New York

Filed June 21, 1968, Ser. No. 739,070
Int. Cl. H03k *17/56*
U.S. Cl. 307—240 **9 Claims**



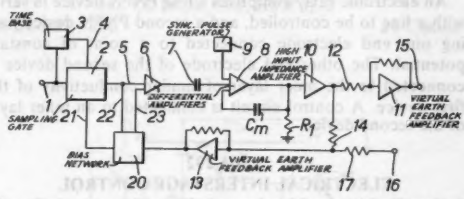
An inherently balanced, thermally stable signal chopper circuit. A field effect transistor connected across a variable signal source is driven by a chopper drive circuit. The chopped signal is applied to a differential amplifier. Grounding the substrate balances and minimizes interelectrode capacitances to minimize chopper drive signals at the differential amplifier output.

3,564,289

ELECTRICAL SAMPLING ARRANGEMENT

Robin T. Smith-Saville, Cambridge, England, assignor to Cambridge Consultants Limited, Cambridge, England

Filed Apr. 8, 1968, Ser. No. 719,396
Claims priority, application Great Britain, Apr. 17, 1967, 17546/67
Int. Cl. H03k *5/00, 17/00;* **H03f** *3/68*
U.S. Cl. 307—246 **10 Claims**



A circuit for sampling a continuous repetitive waveform which includes an input gate, a memory device to store a signal related to the gated input signal, and a feedback path from the memory device to the gate in order to ensure that only variations in the sampled signal are transmitted to the memory device, the intervals between the instants of sampling being so arranged that a signal may be obtained from the memory device representative of a cycle of the waveform.

3,564,290

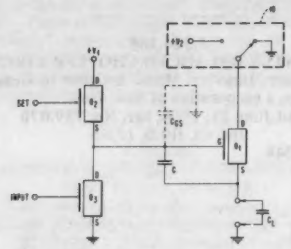
REGENERATIVE FET SOURCE FOLLOWER

George Sonoda, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1969, Ser. No. 807,782
Int. Cl. H03k *17/60*
U.S. Cl. 307—251 **11 Claims**

This specification describes a logic circuit having a capacitor coupled between the gate and source of an FET to cause the potential at the gate to follow the potential at source. The charge of this capacitor is controlled to render the FET conductive or nonconductive so that pulses applied to the drain of the FET can be selectively gated or not gated through the

FET to a load connected to the source of the FET. By operating the FET in this way small supply voltages may be



used. These voltages can be in the order of the size of the signals transmitted to the load.

3,564,291

ELECTRONIC RELAY ARRANGEMENT

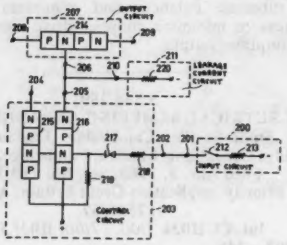
Einar Andreas Aagaard, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1967, Ser. No. 684,240

Claims priority, application Netherlands, Nov. 30, 1966, 6616834

Int. Cl. H03k *5/20*

U.S. Cl. 307—252 **13 Claims**



An electronic relay comprises a first PNPN device in series with a line to be controlled, and a second PNPN device having one end electrode connected to a point of constant potential. The other end electrode of the second device is connected to the inner layer of similar conductivity of the first device. A control circuit is connected to an inner layer of the second device.

3,564,292

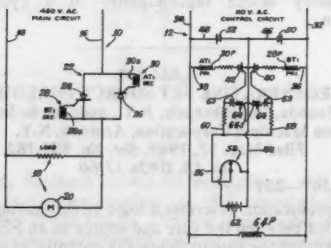
ELECTRICAL INTERSTAGE CONTROL

Arthur K. Littwin, Lincolnwood, Ill., assignor to Arthur K. Littwin; Robert L. Littwin; Donald F. Littwin and Horace A. Young, Chicago, Ill., as trustees under trust dated 1/2/51 known as Littwin Family Trust No. 1

Filed Jan. 12, 1967, Ser. No. 608,865

Int. Cl. H03k *17/00*

U.S. Cl. 307—252 **6 Claims**



Auxiliary SCR's of low current carrying capacity utilized for controlling main SCR's of high current carrying capacity, to compensate for internal heating of the main SCR's, and physically and spatially separated to compensate for ambient heating.

3,564,293

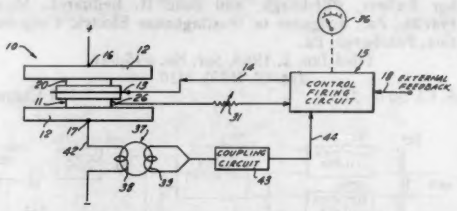
TEMPERATURE-COMPENSATING THYRISTOR CONTROL

John E. Mungenast, Skaneateles, N.Y., assignor to Power Semiconductors, Inc., Devon, Conn.

Filed Apr. 16, 1968, Ser. No. 721,698

Int. Cl. H03k *17/00*

U.S. Cl. 307—252 **13 Claims**



A temperature-sensing element is mounted in good heat transfer relation with a thyristor, and is connected to a control winding of the thyristor firing control circuit. When the temperature of the thyristor rises too high for existing operating conditions the sensing element is effective to reduce the current flow in the thyristor, without stopping it altogether. A signal derived from the current flow through the thyristor may be combined with a signal from the temperature-sensing means to provide a control more accurately representative of the junction temperature in the thyristor. The control is continuous over a predetermined temperature range.

3,564,294

PULSE WELDING CIRCUITS

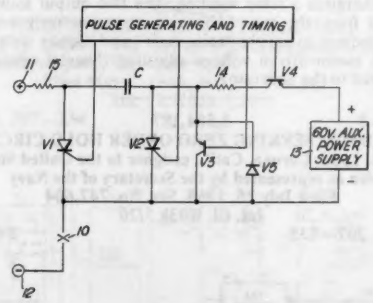
Nigel C. Balchin, Cambridge, England, assignor to The Welding Institute, Cambridge, England

Filed June 7, 1968, Ser. No. 735,266

Claims priority, application Great Britain, June 9, 1967, 26,779/67

Int. Cl. H03k *17/00*

U.S. Cl. 307—252 **4 Claims**



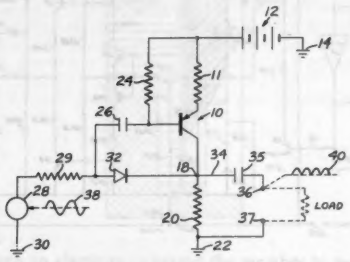
In a pulses current power supply utilizing a thyristor to supply current to a load and a commutating thyristor and capacitor for switching off the load-current thyristor, a transistor is pulsed in timed relation to triggering pulses applied to the two thyristors and is so connected in the commutating thyristor circuit that if the commutating thyristor is on when the transistor conducts the transistor switches the commutating thyristor off. This overcomes the problem of miscommutation, when an arc load is first applied, for example, which would otherwise leave both thyristors conducting.

3,564,295

FREQUENCY DOUBLING CIRCUIT

Mathew A. Slaats, Jasper, Ind., assignor to Kimball Piano & Organ Co., Jasper, Ind.

Filed July 19, 1967, Ser. No. 654,613
Int. Cl. H03k 5/00
U.S. Cl. 307—261 8 Claims



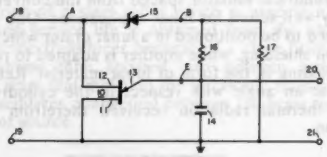
The specification discloses a frequency doubling circuit in which the input side of the circuit receives alternating current and one half wave thereof is supplied to the output side of the circuit via a diode while the other half wave biases a transistor to conduction to supply a half wave to the output side of the circuit of the same polarity as the half wave supplied via the diode. A capacitor between the output side of the circuit and a load stage blocks direct current so the supply to the load stage is in the form of alternating current at double the frequency of the current supply to the input side of the circuit.

3,564,296

WAVEFORM SHAPING CIRCUIT COMPRISING A UNIJUNCTION TRANSISTOR AND ZENER DIODE

Jackson Lum, Bayside, N.Y., assignor to Sylvania Electric Products, Inc.

Filed July 19, 1968, Ser. No. 746,228
Int. Cl. H03k 5/00
U.S. Cl. 307—261 8 Claims



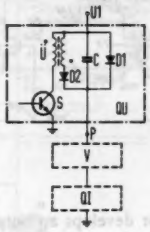
A circuit for converting an input voltage waveform having a magnitude which varies slowly with time to a substantially rectangular voltage pulse having a steep leading edge. The output pulse is initiated when the input voltage falls below a first predetermined magnitude and is terminated when the input voltage increases above a second predetermined magnitude. In one embodiment, the input voltage is applied between the two base terminals of a unijunction transistor and the output pulse obtained across a capacitor connected between the emitter terminal and one of the base terminals of the transistor. A Zener diode is coupled between the emitter and the other base terminal of the transistor.

3,564,297

CIRCUIT ARRANGEMENT FOR PRODUCING CURRENT IMPULSES WITH VERY STEEP FLANKS

Peter Elsner, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 16, 1967, Ser. No. 638,830
Claims priority, application Germany, May 25, 1966, S103977
Int. Cl. H03k 5/12
U.S. Cl. 307—263 1 Claim



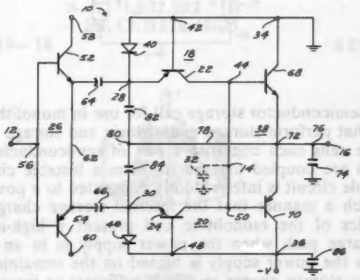
A circuit arrangement for the production of current impulses with very steep flanks, utilizing current impulses of an impressed current source, in which the current impulse source is connected to a voltage supply therefor with a time dependent voltage source, with the impulse current source being supplied at its load, during the initiation of an impulse, with the full operating voltage and thereafter for the remainder of the impulse with an operating voltage which covers only the circuit losses.

3,564,298

DYNAMIC AMPLIFIER LEVEL CONVERTER

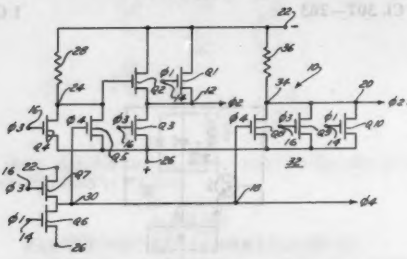
Ronald P. Colino, Commack, N.Y., assignor to General Instrument Corporation, Newark, N.J.

Filed Dec. 5, 1968, Ser. No. 781,509
Int. Cl. H03k 5/08; H03f 3/18
U.S. Cl. 307—268 24 Claims



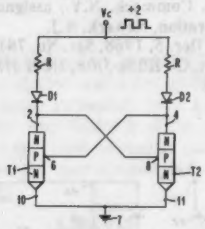
A pulse amplifier circuit comprises a pair of switching stages operatively connected between an input node and a signal node. Each switching stage is respectively actuated by signals derived from the leading and trailing edges of the input pulse, the signal node being charged between its two levels as a result of the alternate conduction of the switching stages. Neither switching stage is conductive in the period between the charging cycles of the signal node, the signal level at that node remaining substantially quiescent during that period.

3,564,299
CLOCK GENERATOR
Andrew G. Varadi, Briarwood, and Richard B. Rubinstein, New York, N.Y., assignors to General Instrument Corporation, Newark, N.J.
Filed Jan. 16, 1969, Ser. No. 791,588
Int. Cl. H03k 17/26
U.S. Cl. 307—269 14 Claims



A clock generator develops an output timing signal from two input signals having a time interval therebetween. A clamping device controlled by the input signals is effective to maintain said output signal at its desired level during the interval between the input signals, and means are provided to maintain the voltage level at the input node at an appropriate level during that interval.

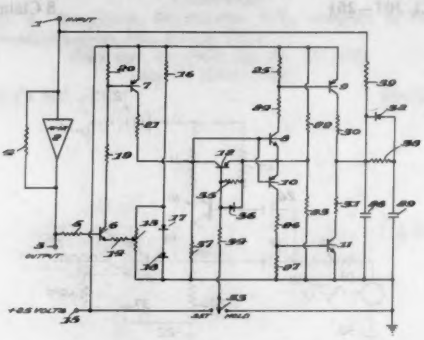
3,564,300
PULSE POWER DATA STORAGE CELL
Robert A. Henle, Hyde Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 6, 1968, Ser. No. 710,947
Int. Cl. H03k 3/26
U.S. Cl. 307—291 11 Claims



A semiconductor storage cell for use in monolithic memories that perform storage and/or logic and storage functions. These cells each comprise a pair of semiconductor devices which are coupled together to form a bistable circuit. The bistable circuit is intermittently connected to a power supply in such a manner that the internal storage charge characteristics of the monolithic cell present a high-impedance discharge path when the power supply is in an off state. When the power supply is turned on the remaining voltage on the storage charge circuit is sufficient to insure that the monolithic memory cell attains its previous bistable state which existed prior to the power supply being turned off.

3,564,301
DARK CURRENT COMPENSATING CIRCUIT
John D. McGhee, Plymouth Meeting, Pa., and Raymond W. Tabeling, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.
Filed Feb. 9, 1968, Ser. No. 704,443
Int. Cl. H03k 3/42
U.S. Cl. 307—311 14 Claims

The disclosure relates to an electrical circuit and method for suppressing the effect of undesirable electrical signal, such as, the dark current of a photomultiplier tube. The circuit comprises, preferably, a current-to-volts amplifier with a feedback that includes a noninverting amplifier and a memory. The method for suppressing the effect of dark current consists of biasing the memory under no light conditions until the output potential of the current-to-volts amplifier is zeroed to the input level and holding the bias while monitoring the output of the current-to-volts amplifier under light conditions.



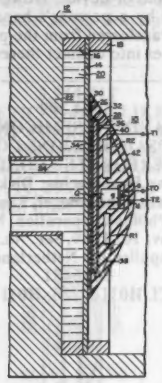
3,564,302
NUCLEAR-THERMIONIC LUNAR BASE POWER SUPPLY
William J. Levedahl; Frederick A. Schumann; Edward A. Scicchitano, Baltimore, and Gareth L. Reed, Bethesda, Md., assignors to Teledyne, Inc., Los Angeles, Calif.
Filed Nov. 5, 1964, Ser. No. 409,142
Int. Cl. H02n 3/00
U.S. Cl. 310—4 19 Claims

A nuclear powered direct energy converter system employing a cylindrical radiator spaced from the converter and particularly well suited for lunar applications. One embodiment is adapted to be positioned in a lunar crater which constitutes radiation shielding, while another is adapted to receive radiation shielding in the form of lunar material. Reflectors positioned at an angle with respect to the cylindrical radiator reflect thermal radiation received therefrom in an axial direction.

3,564,303
ENCAPSULATED TRANSDUCER ASSEMBLY
Frederick G. Geil, Pittsburgh, and William K. Dunsworth, Export, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 7, 1968, Ser. No. 765,463
Int. Cl. H04r 17/00
U.S. Cl. 310—8.1 4 Claims

An electromechanical transducer assembly is disclosed wherein a transducer member, for example a piezoelectric crystal, is utilized to convert a mechanical input thereto to an electrical output. An amplifier circuit including an active element, such as a field effect transistor of the metal oxide silicon type, is disposed on the member to receive the electrical output and to increase its power gain. An elastomer is disposed over the entire circuit and the member to encapsu-

late the entire circuit and prevent low-impedance paths from developing in and about the circuit. The elastomer is selected



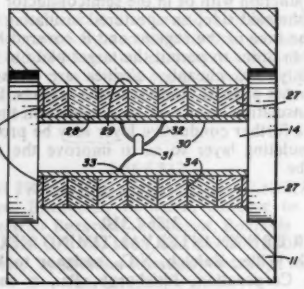
to have such an elasticity to permit the member to be highly sensitive to the mechanical input thereto.

3,564,304

ELECTRODE CONFIGURATION FOR TUBULAR PIEZOELECTRIC HIGH-STRAIN DRIVER

William E. Thorn, Pittsburgh, and Robert H. Whittaker, Export, Pa.

Filed Sept. 22, 1969, Ser. No. 859,654
Int. Cl. H01v 7/00
U.S. Cl. 310—8.2 **5 Claims**



A cylindrical piezoelectric high-strain ultrasonic driver made up of a plurality of ceramic rings is imbedded in the interior of a steel roller which is used in a rolling mill. Long service life is obtained from the ultrasonic piezoelectric transducer because of a close-fitting, thin-walled, brass tube epoxied into position inside the ceramic rings that make up the ultrasonic transducer. A spider facilitates connection between the brass tube and the power source.

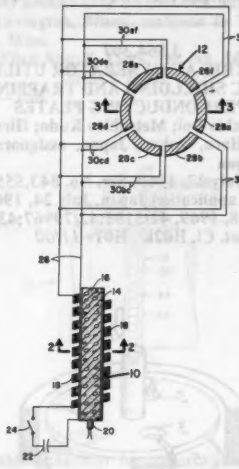
3,564,305

METHOD AND APPARATUS FOR CREATING PULSED MAGNETIC FIELD IN A LARGE VOLUME

David B. Cummings, Alamo, Calif., assignor to Aerojet General Corp., El Monte, Calif.

Continuation-in-part of application Ser. No. 390,408, Aug. 18, 1964, now abandoned. This application Apr. 5, 1965, Ser. No. 445,495
Int. Cl. H02k
U.S. Cl. 310—10 **6 Claims**

This disclosure concerns a method and apparatus for creating a pulsed magnetic field in a large volume wherein the pulsed magnetic field may simulate the electromagnetic pulse effects produced by a nuclear detonation. The apparatus comprises an explosive generator disposed in an electrical circuit which includes a segmental inductive loop having a plurality of individual loop segments. The individual loop segments are respectively connected in series in the electrical circuit with the explosive generator and in parallel with respect to each other. The explosive generator includes an explosive charge mounted in a cylindrical armature which is surrounded by helical inductor coil. Upon discharging a pulse of electrical current through the inductor coil and detonating the explosive charge at one end of the armature, the armature is expanded so as to progressively contact the surrounding inductor coil along the length thereof. Thus, the electrical



circuit is progressively short circuited, and the trapped magnetic flux is compressed. The trapped magnetic flux is then transferred by the explosive generator into the individual loop segments of the inductive loop with a corresponding increase in current and energy thereby establishing a pulsed magnetic field within the loop volume which is sufficiently large to simulate the electromagnetic pulse effects of a nuclear detonation.

3,564,306

DRIVE DEVICE FOR BATTERY ENERGIZED SOUND RECORDING APPARATUS

Hanns Ott, Harsdorferstr, 44, Nurenberg, and Jurgen Wenk, Ebrardstr. 62, Erlangen, Germany

Filed Nov. 20, 1968, Ser. No. 777,444
Claims priority, application Germany, Nov. 30, 1967, 1,572,502
Int. Cl. H02k 19/00
U.S. Cl. 310—10 **4 Claims**

A drive device for driving the sound record medium of battery energized sound recording apparatus comprises a battery

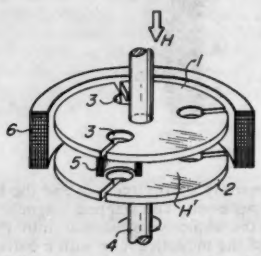
supply and a direct current brushless motor energized from the battery supply and having a shaft driving the sound record medium. The shaft is thus a tone shaft. The motor comprises a stator having an axial bore formed therethrough and a rotor coaxially positioned around the stator. The stator has a plurality of half open slots formed therein and a multipole stator winding in the slots comprising a pair of separated phase windings mounted in the slots in a manner whereby they are electrically displaced by 90° each of the phase windings comprises two wires.

3,564,307

ROTARY ELECTRIC AC GENERATOR UTILIZING THE MAGNETIC SHIELDING AND TRAPPING BY SUPERCONDUCTING PLATES

Ushio Kawabe; Toshio Doi; Metsuhiro Kudo; Hiroshi Kimura, and Nobuhiro Hara, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 22, 1969, Ser. No. 843,555
Claims priority, application Japan, July 24, 1968, Nov. 4, 1968, June 18, 1969, 42/5185;42/79967;43/47595
Int. Cl. H02k ; H01v *11/00*
U.S. Cl. 310—10 **7 Claims**



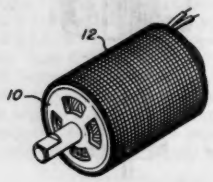
An AC generator having a plurality of parallelly spaced discs of inhomogeneous hard superconducting material rotatable about a common axis. The rotating discs are provided with a suitable number of registered slots, and armature coils are disposed between the discs so that the magnetic shielding and trapping property of the superconducting material is utilized for generating an alternating voltage.

3,564,308

BURN PREVENTING FORAMINATE MATERIAL ARRANGEMENT ON ELECTRIC MOTORS

James C. Ryan, Springfield, Ohio, assignor to Robbins & Myers, Inc., Springfield, Ohio

Filed July 30, 1968, Ser. No. 748,853
Int. Cl. H02k *5/02, 15/14*
U.S. Cl. 310—43 **4 Claims**



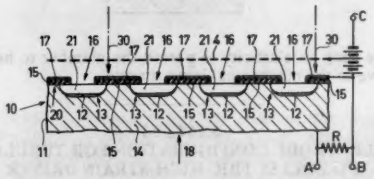
Protective material for covering a heated element, such as an electric motor, or machine, or device, or the like, for protecting personnel against burns which might be encountered from engagement with the heated element. The protective material comprises a sheet of material which has relatively low thermal conductivity and which has a multiplicity of apertures therethrough and, which, for example, may be a screen or screenlike material which is positioned in covering engagement with the machine. Because the protective material has a multiplicity of apertures therethrough, the protective material does not significantly affect the dissipation of heat from the machine or device. However, if the protective material is engaged by a persons's hand, only a very small quantity of heat is transferred from the protective material to the person who comes into contact therewith.

3,564,309

CAMERA TUBE HAVING A SEMICONDUCTOR TARGET WITH PN MOSAIC REGIONS COVERED BY A CONTINUOUS PERFORATED CONDUCTIVE LAYER

Arthur Marie Eugene Hoeberechts; Dirk De Nobel, and Paul Anton Herman Hart, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,232
Claims priority, application Netherlands, Nov. 19, 1968, 6816451
Int. Cl. H01j *31/26;* H01l *15/00*
U.S. Cl. 313—66 **10 Claims**



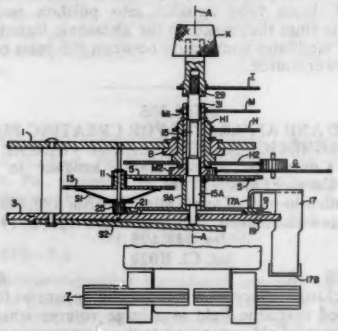
The invention relates to a camera tube having a photosensitive target plate to be scanned by an electron beam and formed by a semiconductor plate which on the side to be scanned is provided with a mosaic of regions which form a rectifying junction with or in the semiconductor plate, and in which on the said side, an apertured insulating layer is provided at the area of the regions and is covered by a conductive layer. In order to permit the target plate to be manufactured simply and cheaply, cavities are provided in the semiconductor plate at the area of the regions. Furthermore, a further insulating layer may be provided on the conductive layer and a further conductive layer may be provided on the further insulating layer so as to improve the effect of the camera tube.

3,564,310

MOTOR DRIVEN INTERVAL TIMING MECHANISM

Thomas G. Willis, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

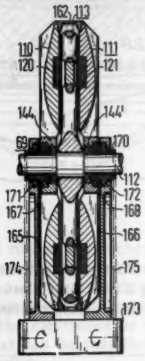
Filed Nov. 12, 1968, Ser. No. 774,940
Int. Cl. H02h *7/06*
U.S. Cl. 310—83 **6 Claims**



An electric motor driven mutilated timing gear is manually set in either direction away from an "off" position. A signal

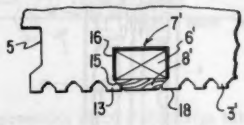
device is held in "nonsignal" condition by a face of the gear. The gear is rotated towards the off position by a timing mechanism. When the gear reaches a signal position it releases the signal device and is decoupled from the timing mechanism.

3,564,311
ELECTROMAGNETICAL DISC-LIKE CONSTRUCTED EDDY CURRENT BRAKE
Hartwig Beyersdorf, Bremen-Arbergen, Germany (Sehmsdorfer Strasse 10 2060 Bad Oldesloe Germany)
Filed Nov. 14, 1968, Ser. No. 778,378
Int. Cl. H02k *49/04*
U.S. Cl. 310—93 **2 Claims**



A flat rotor to be braked is formed with aligned inner and outer spokes spaced by a coaxial nonmagnetic ring which rotor is located between two stationary conductive discs in which are seated coaxial coils opposite said ring. Direct current is supplied to the coils to induce eddy currents in the conductive discs for braking.

3,564,312
MEDIUM FREQUENCY INDUCTOR GENERATORS
Victor Bunea, Bucharest, Romania, assignor to Wzina De Masini Electrice Bucaresti, Bucharest, Romania
Filed Oct. 18, 1968, Ser. No. 804,330
Claims priority, application Romania, Oct. 18, 1967, 54,899
Int. Cl. H02k *19/24*
U.S. Cl. 310—168 **6 Claims**



The operating characteristics of a medium-frequency generator of the inductor-alternator type are improved without requiring the use of a series condenser for load compensation by constructing a generator so that it includes at least the first two and preferably all of the following structural features:

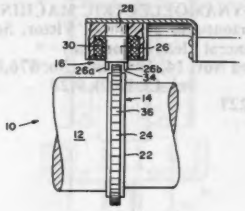
1. the number of armature coils in the armature winding of the generator is such that when the generator is operating under open circuit conditions, the maximum output voltage is at most equal to the nominal or rated output voltage;

2. the width of the permeance teeth on both the stator and the rotor is equal to from $0.25t$ to $0.4t$, where t is the pitch of the slots separating the teeth, i.e. the peripheral spacing of a point on one tooth from the corresponding point on the adjacent tooth;

3. the permeance teeth are given a profile whereby the width thereof is constant for a height which is less than the width and then rapidly increases for the remainder of the total height; and

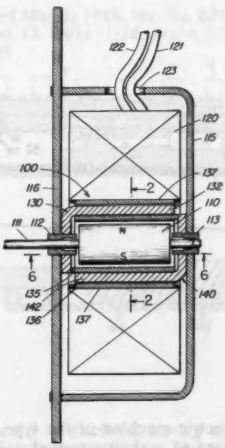
4. the armature winding conductors, which are mounted in slots distributed about the periphery of the stator are positioned as close to the air gap as possible in order to reduce the leakage reactance of the armature winding.

3,564,313
SELF-COMPENSATING TACHOMETER GENERATOR
Dan Goor, Lexington, Mass., assignor to Trans-Sonics, Inc., Lexington, Mass.
Filed Aug. 8, 1969, Ser. No. 848,465
Int. Cl. H02k *19/24*
U.S. Cl. 310—168 **2 Claims**



A tachometer generator has rotor and stator pole pieces which interfit as they move relative to one another so as to provide at least a pair of relatively low reluctance stator-rotor flux paths parallel to the axis of rotation of the rotor.

3,564,314
ROTOR-STATOR CAPSULE CONSTRUCTION
Arthur W. Haydon, Breakneck, Conn., assignor to Tri-Tech, Incorporated, Waterbury, Conn.
Continuation-in-part of application Ser. No. 687,843, Dec. 4, 1967, now Patent No. 3,495,111, dated Feb. 10, 1970. This application July 11, 1969, Ser. No. 840,911
Int. Cl. H02k *17/10*
U.S. Cl. 310—172 **16 Claims**



A rotor-stator capsule for use with a field-winding to form an electric motor. The rotor of the capsule comprises a

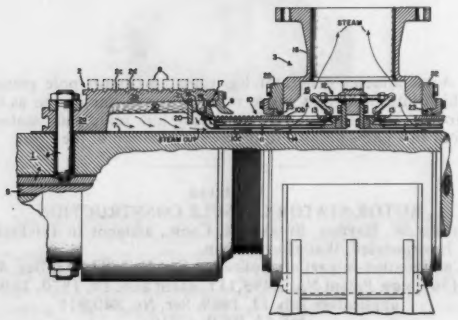
slender cylinder of permanently magnetized ferrite material, while the stator structure includes a pair of stator pole pieces at opposite ends of the rotor, each pole piece has a flat portion and two salient stator poles extending perpendicularly from the periphery of the flat portion in radially spaced relationship with the rotor. A tubular dust cover surrounding the rotor serves as a part of the shading assembly used to make the motor unidirectionally self-starting and this dust cover lies in the airgap between the rotor and the stator poles and extends axially along these poles for the length of the rotor. The shading assembly also is provided with a shading member which is interwoven with the stator poles and cooperates with the dust cover to complete the magnetic circuit.

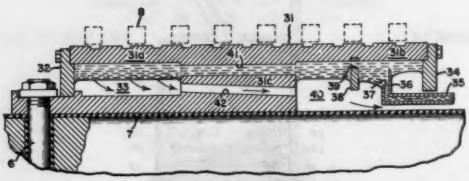
3,564,315

EVAPORATIVE COOLED COLLECTOR RINGS FOR DYNAMOELECTRIC MACHINE

Sterling C. Barton, and Joseph A. Victor, Scotia, N.Y., assignors to General Electric Company

Filed Nov. 14, 1969, Ser. No. 876,866
Int. Cl. H02k *9/28*
U.S. Cl. 310—227 **5 Claims**





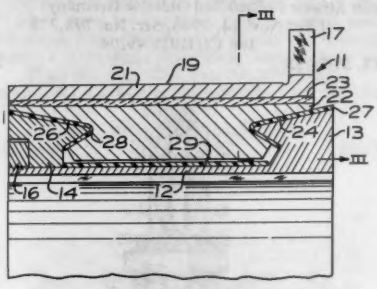
In a dynamoelectric machine of the type having brushes transmitting current to a shaft-mounted collector ring, the ring is cooled by vaporization of water fed to its underside by a sleeve enclosing the shaft. The sleeve and shaft form an annular passage which conducts steam away from the collector. The sleeve has a radial ring providing a liquid seal and internal passages to feed the liquid into the vaporization chamber.

3,564,316

COMPOSITE COMMUTATOR BAR

Marion J. Witzenburg, Peoria, and Kenton C. Opperman, Morton, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 9, 1969, Ser. No. 814,664
Int. Cl. H02k *13/04*
U.S. Cl. 310—236 **1 Claim**



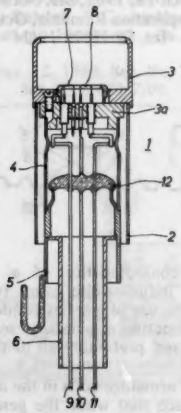
A commutator bar compositely formed to have a conductive section including a riser and a brush contact forming indentations which permit clamping rings to secure the bar upon assembly.

3,564,317

CATHODE FOR AN X-RAY TUBE COOLED BY HEAT-CONDUCTIVE COAXIAL CYLINDERS

Werner Berends and Walter Hartl, Hamburg, and Heinz Jurgen Jacob, Hamburg-Glashutte, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1968, Ser. No. 727,252
Claims priority, application Germany, May 13, 1967, M73983
Int. Cl. H01j *61/52, 7/24*
U.S. Cl. 313—37 **5 Claims**

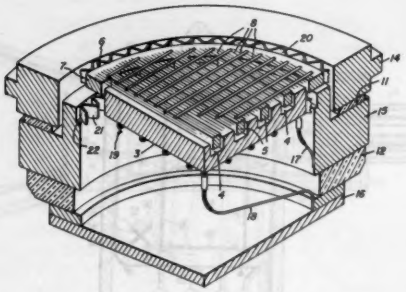


A cathode for an X-ray tube which is mechanically rugged and cooled through coaxially arranged hollow cylinders at least one of which is joined to the cathode with good thermal conductivity and the other projects from the glass envelope of the X-ray tube, both cylinders being joined to one another.

3,564,318
ELECTRODE SUPPORT STRUCTURE UTILIZING A CORREGATED METAL RIBBON FOR ACCOMMODATING THERMAL EXPANSION

James E. Beggs, Schenectady, N.Y., assignor to General Electric Company

Filed Mar. 27, 1969, Ser. No. 810,951
Int. Cl. H01j 61/52; H01k 1/58
U.S. Cl. 313—37 14 Claims

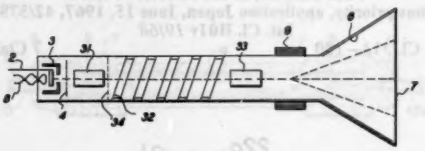


A corrugated metal ribbon is attached between the outer circumference of a planar grid or cathode electrode and the interior opening of a contact member, the corrugated member accommodating thermal expansion differentials without distortion of the electrodes or contact members so that the electrodes that can be mounted and maintained in precise spaced relationship.

3,564,319
CATHODE RAY TUBE WITH MATRIX FORMING ELEMENTAL ELECTRON BEAMS AND MEANS FOR SELECTIVELY FORMING THEM INTO CHARACTERS AT THE FACE PLATE OF THE TUBE

Arthur T. Starr, New Barnet, and Peter F. T. C. Stillwell, Crookham Village, England, assignors to Zerox Corporation, Rochester, N.Y., a corporation of New York

Filed Jan. 4, 1968, Ser. No. 695,626
Int. Cl. H01j 29/74; H01i 29/46
U.S. Cl. 313—77 6 Claims



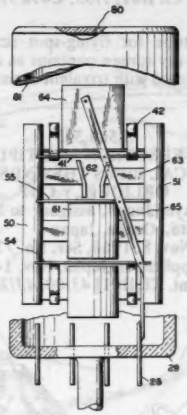
A character generator electric discharge tube for selectively switching elemental portions of an electron beam. With the use of accelerating cylinders and spirals between the electron gun and the electromagnetic focus coil, a considerable reduction in the length of the tube is effected.

3,564,320
ELECTRODE MOUNTING STRUCTURE FOR CATHODE RAY TUBES

Horst H. Blumenberg, Owensboro, Ky., assignor to Kentucky Electronics, Inc., Owensboro, Ky.

Continuation-in-part of application Ser. No. 843,296, July 22, 1969. This application Sept. 29, 1969, Ser. No. 861,600
Int. Cl. H01j 29/02, 29/46
U.S. Cl. 313—82 3 Claims

A character display system has a plurality of small cylindrical side-by-side cathode-ray tubes about .8 inch in diameter and less than 4 inches long, aligned to form a line of individual characters. The tubes have structure for precisely aligning the characters uniformly including an electron gun fashioned to center the electron beam by means of electrostatic deflection electrode pairs held in two glass beads oriented with a seven pin miniature glass stem to produce two normal deflection axes. Similar electrode structure is employed for a plurality of electrodes in the gun formed of a rectangular shaped blank held at opposite ends in the two beads, and a set of snubber springs is affixed to one such electrode oriented toward the stem to and in centering the gun within the tube cylindrical walls.



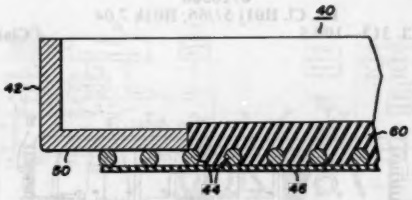
ERRATUM

For Class 313—66 see:
Patent No. 3,564,309

3,564,321
MESH-REINFORCED SECONDARY ELECTRON CONDUCTION TARGET FOR CAMERA TUBES

Ideal T. Saldi, Manilus, N.Y., assignor to General Electric Company

Filed May 1, 1969, Ser. No. 820,782
Int. Cl. H01j 31/26, 31/30, 29/45
U.S. Cl. 313—89 2 Claims



A target structure is disclosed having superior electrical properties and mechanical strength. The target comprises a layer of KCl supported by a dielectric material which in turn is deposited on a fine nickel metal mesh which provides mechanical support for the target. This structure is particularly useful in the construction of secondary electron conduction (SEC) targets.

3,564,322

CATHODE-RAY TUBE FOR FLYING-SPOT SCANNING

George Blasse and Alfred Bril, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 23, 1968, Ser. No. 723,551
Claims priority, application Netherlands, Apr. 29, 1967, 6706095
Int. Cl. H01j *1/63*; C09k *1/68*
U.S. Cl. 313—92 4 Claims

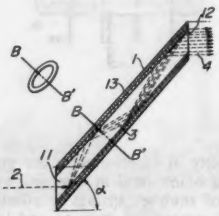
A cathode-ray tube for flying-spot scanning devices in which the cathode-ray screen contains as a phosphor a yttrium aluminate activated with trivalent cerium.

3,564,323

SECONDARY-ELECTRON MULTIPLIER HAVING TILTED ELLIPTICAL PIPES THE ENDS OF WHICH ARE OBLIQUELY CUT

Haruo Maeda, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 8, 1968, Ser. No. 774,413
Claims priority, application Japan, Nov. 14, 1967, 42/73824
Int. Cl. H01j *43/00*, *43/22*
U.S. Cl. 313—105 2 Claims



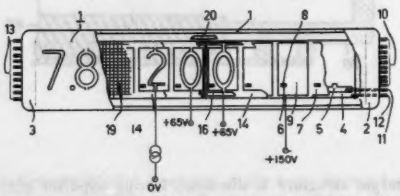
A secondary-electron multiplier of the channel type having a plurality of channel pipes combined in the form of a bundle. In the multiplier, the channel pipes are arranged to make an angle with respect to the advancing direction of primary electrons and have an oval cross-sectional shape, while the opposite ends of the channel pipes are cut to have a substantially circular section.

3,564,324

GAS DISCHARGE TUBE COMPRISING A NUMBER OF ELECTRODES UNITED TO FORM A GROUP AND HAVING THE FORM OF CHARACTERS

Adrianus Anthonius Maria Hendriks, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 18, 1968, Ser. No. 776,471
Claims priority, application Netherlands, Dec. 6, 1967, 6716506
Int. Cl. H01j *61/66*; H01k *7.04*
U.S. Cl. 313—109.5 4 Claims



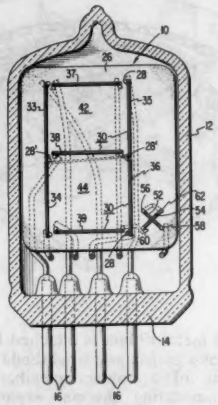
The digit-electrodes of a number of character-shaped electrodes of electrode groups placed side by side in a common envelope are shaped as punched strips, stacked one on the other.

3,564,325

DISPLAY DEVICE INCLUDING A POINT IMAGE

Richard Arthur Bonnette, New Providence, and Norman Lee Lindburg, Berkeley Heights, N.J., assignors to RCA Corporation, a corporation of Delaware

Filed Apr. 29, 1969, Ser. No. 820,216
Int. Cl. H01j *61/66*; H01k *7/04*
U.S. Cl. 313—109.5 6 Claims



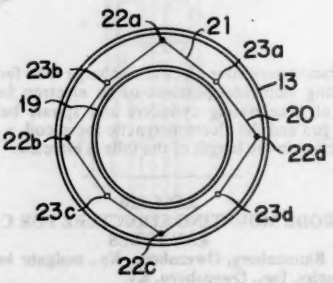
A display device of the type comprising a plurality of light sources so arranged that when various combinations of the sources are selectively energized, various luminous first symbols are produced. A luminous "point" second symbol is also provided comprising a pair of intersecting filaments forming a letter X and having a size substantially smaller than the first symbols.

3,564,326

IMAGE PICKUP TUBE

Yorikatsu Irisaka, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 12, 1968, Ser. No. 736,498
Claims priority, application Japan, June 15, 1967, 42/37842
Int. Cl. H01v *19/68*
U.S. Cl. 313—180 7 Claims



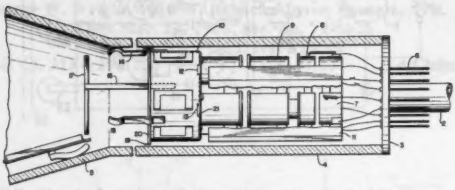
An evaporator for an image pickup tube comprises base metal sources attached to symmetrically disposed bent portions of otherwise straight heater lines wherein the radius of a circle connecting these sources is greater than in conventional arrangements of this type.

3,564,327

GETTER ARRANGEMENT IN COLOR PICTURE TUBE

Jay H. Johnson, Owensboro, Ky., assignor to Kentucky Electronics, Inc., Owensboro, Ky., a corporation of Delaware

Filed Feb. 12, 1969, Ser. No. 798,739
Int. Cl. H01j *19/70*
U.S. Cl. 313—181 2 Claims



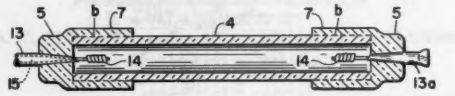
A getter structure arrangement for a three-gun color picture cathode-ray tube is disclosed, wherein the convergence electrode structure is formed to block the neck of the tube and prevent any getter particles from migrating to the vicinity of the electron emitting cathode. The convergence electrode has an outwardly flanged rim to reduce the spacing from the inner envelope surface and has inwardly flanged beam apertures forming ridges for reducing chances of getter particles entering the convergence cup from reaching the cathode.

3,564,328

CERAMIC ARTICLES AND METHOD OF FABRICATION

Rodney D. Bagley, Corning, and Edwin J. Force, Big Flats, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 730010, May 17, 1968, now abandoned. This application July 29, 1968, Ser. No. 748,516
Int. Cl. C03b *23/20;* H01i *61/30*
U.S. Cl. 313—220 19 Claims



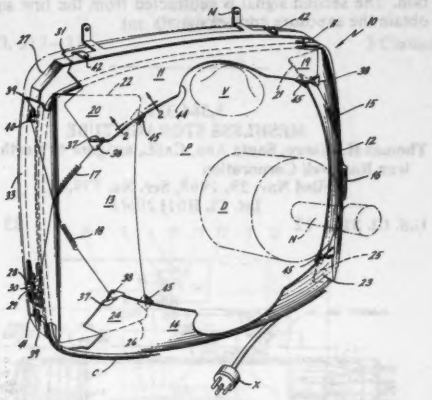
Method of forming gas tight seals between polycrystalline ceramic bodies without a sealant material. Method, which is useful for joining sections of ceramic tubing in gastight relationship and for providing gastight seals for tubular bodies, depends on differing degrees of firing shrinkage of the components being joined, their ability to sinter together, and on the fact that the components, when fired, have substantially the same coefficient of thermal expansion. Various means of providing for differential firing shrinkages, such as a polycrystalline ceramic tube fired to near theoretical density is inserted in closely fitted relationship into a green tubular body of the same composition and the assembly is fired until both components are of maximum density. Sintering and shrinkage of the outer tubular body onto the inner body produces a monolithic structure with a completely continuous crystal structure across and replacing the former physical contact boundary. Ceramic articles, such as gas discharge lamp structures, embodying tubular ceramic bodies having end closures made by described method.

3,564,329

SHIELDING APPARATUS OF METAL PLATES STRAP-MOUNTED ON CATHODE RAY TUBE FOR SHIELDING AGAINST EXTERNAL MAGNETIC FIELDS

John P. Uetz, Philadelphia, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa., a corporation of Delaware

Filed Oct. 28, 1968, Ser. No. 771,214
Int. Cl. H01j *29/06*
U.S. Cl. 315—8 2 Claims



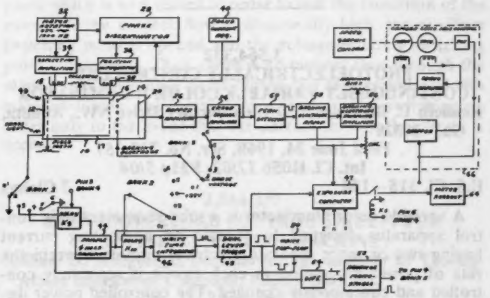
Apparatus for shielding cathode ray tubes, particularly color picture tubes, from the effect of the earth's and other external magnetic fields. The shielding apparatus comprises a series of overlapping steel sheets, pressed together and against the tube structure by resilient fasteners. These sheets and fasteners are secured to a strap which is tightened around the circumference of the cathode ray tube, near the front thereof, and shaped and disposed for securement to the inside of a cabinet enclosing the tube.

3,564,330

DEVICE FOR PROVIDING EXPOSURE CONTROL FOR A CAMERA

Harry O. Pfeiffer, North Canton, Ohio, assignor, by mesne assignments, to the United States of America as represented by the Secretary of the Air Force

Filed Mar. 28, 1969, Ser. No. 812,580
Int. Cl. H01j *31/26*
U.S. Cl. 315—10 9 Claims



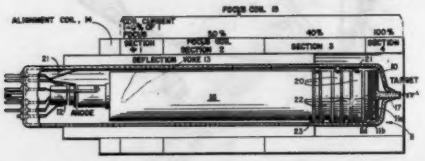
A device to provide an exposure control signal which may be used directly to control camera exposure or may be used

to provide a meter indication which may be used to control the iris setting or exposure time of the camera makes use of an electron image correlator, which is normally used to obtain correlation between two electron images, to provide a first signal proportional to photocathode current, which is related to integrated scene brightness. The first signal is used to control the write time of the correlation tube storage element. The first signal is modified by a second signal which is a function of scene detail of the lower brightness portion of the scene which is obtained by adjusting the storage element, backing electrode potential to maximize the correlation function. The second signal is subtracted from the first signal to obtain the exposure control signal.

3,564,331
MESHLESS STORAGE TUBE

Thomas H. Moore, Santa Ana, Calif., assignor to North American Rockwell Corporation

Filed Nov. 29, 1968, Ser. No. 779,912
Int. Cl. H01j *29/41*
U.S. Cl. 315—12 **23 Claims**



A single gun, meshless storage tube of an immersed optics system type, and having an axial electric field generator and a doubly tapered focus deflection field generator. Avoidance of the meshes improves image resolution and structural ruggedness. The tapered axial focus field provides a planar focal surface, as to avoid the necessity for dynamic focusing and the immersed optics provides better resolution. Thus, a given degree of resolution and data density may be obtained with a smaller, ruggeder tube. Because the storage tube dielectric is mounted on a mechanically rigid substrate, greater mismatch of thermal coefficients of expansion between the dielectric and substrate (of the storage element) are tolerable.

ERRATUM

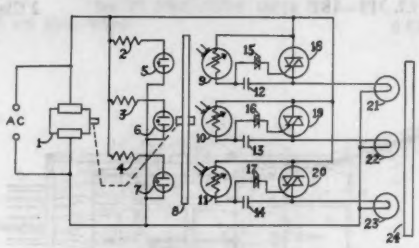
For Class 315—39.61 see:
Patent No. 3,564,340

3,564,332
PHOTOELECTRICALLY CONTROLLED CONTINUOUSLY VARIABLE COLOR ILLUMINATOR

Kenneth L. Blakeslee, 330 Glencourtney Drive NW., Atlanta, Ga. 30328

Filed June 24, 1968, Ser. No. 739,357
Int. Cl. H05b *37/02*; **F21p** *5/04*
U.S. Cl. 315—154 **7 Claims**

A variable color illuminator is a solid state electronic control apparatus designed to operate on alternating current having two or more separate electrical circuits wherein the rate of power dissipation in each circuit is separately controlled and continuously changed. The controlled power dissipation in all circuits is accomplished with a single light attenuation recording which has variations of attenuation from point to point. The recording is continuously moving and is located between light sensitive elements and fixed intensity light sources. The light sensitive elements are an integral part of combined phase shift and pulse networks which activate the power control switches located in each electric circuit. Light variations on the light sensitive elements caused by the light attenuation variations in the moving recording are

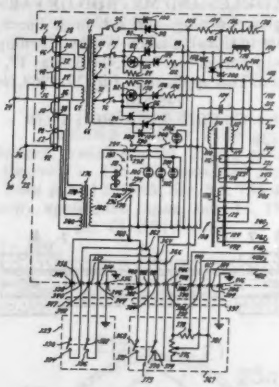


reproduced as power variations in the control circuits. When colored lights are attached to the power circuits and grouped in clusters, lighting effects are produced for advertising and architecture.

3,564,333
ELECTRIC WELDER THAT USES MAGNETIC AMPLIFIER TO SUPPLY FIRING SIGNALS FOR CONTROLLED RECTIFIER

Donald W. Cramer, Eugene W. Becker, Richard E. Meyer, and Owen E. Reinert, St. Louis, Mo., assignors to National Standard Company

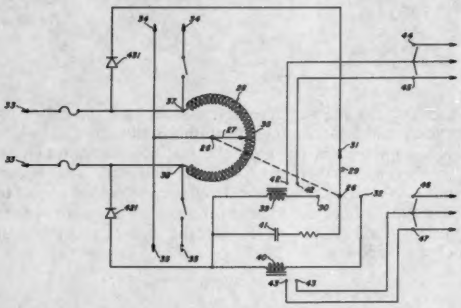
Filed Feb. 21, 1968, Ser. No. 707,254
Int. Cl. H05b *37/00*
U.S. Cl. 315—171 **27 Claims**



The high frequency voltages, that are customarily used to help initiate the arcs of electric welders, tend to cause premature and erratic initiation of those arcs where those electric welders use silicon controlled rectifiers to control the amounts of power supplied to those arcs and use transistor-type firing circuits to control the firing angles of those silicon controlled rectifiers; because transistor-type firing circuits are sensitive to high frequency voltages. The present invention provides an electric welder which utilizes silicon controlled rectifiers to control the amounts of power supplied to arcs and yet avoids premature and erratic initiation of those arcs by using a magnetic amplifier to control the firing angles of those silicon controlled rectifiers. Also, the present invention keeps that electric welder from supplying undesirably high amounts of power to those arcs, during the initiation of those arcs, by biasing the magnetic core of that magnetic amplifier downwardly at the conclusion of each welding opera-

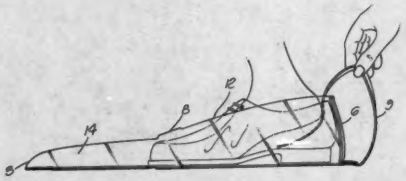
tion. In addition, the electric welder of the present invention has a one-turn winding, on the magnetic core of the magnetic amplifier thereof, through which all of the welding current flows; and that one-turn winding is part of a feedback circuit for that magnetic amplifier which enables that electric welder to vary the amounts of power supplied to an arc over the full range of firing angles of the silicon controlled rectifiers thereof by merely adjusting a single control of that magnetic amplifier.

3,564,334
CONTROL FOR SLIDE PROJECTORS
George W. Wright, 4016 W. Palmaire Drive, Phoenix, Ariz.
Filed Mar. 20, 1968, Ser. No. 714,626
Int. Cl. G05f *1/00*; H05b *37/02*
U.S. Cl. 315—296 **4 Claims**



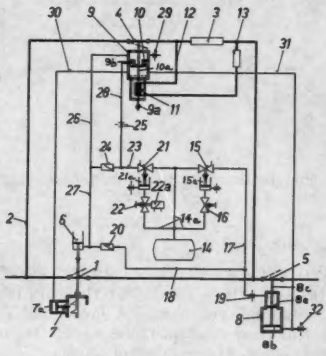
A control unit for a pair of cooperating slide projectors. The control unit includes circuit means including a variable transformer for apportioning light power to the slide projectors to provide relatively constant projected screen illumination at all times. The unit also includes switching means for changing slides in a predetermined manner at appropriate times.

3,564,335
ELECTRICALLY CONDUCTIVE SHOE COVER
Phillip M. Siegel, Los Angeles, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Jan. 30, 1969, Ser. No. 795,233
Int. Cl. H05f *3/00*
U.S. Cl. 317—2 **11 Claims**



A plastic overshoe adapted to be worn by physicians and nurses during surgery to electrically ground their bodies to a floor on which they stand, so static electricity cannot build up and cause a spark near explosive gases sometimes used in surgery. The overshoe fits various shoe sizes and has two superimposed plastic panels joined along their rear and bottom edges with a connecting web across midportions of their top edges holding the panels together. An electrically conductive plastic strip is sealed along a bottom edge of one panel, which strip has an extending portion for tucking into the wearer's shoe or stocking to make electrical contact with his body. A series of these overshoes connected end to end are made by die-cutting and heat-sealing portions of layflat tubular plastic material.

3,564,336
SEQUENTIAL SWITCHING SYSTEM WITH CURRENT LIMITING SHUNT PATH
Paul Buergi, Wil-Turgi, and Rolf Schaumann, Neuenhof, Switzerland, assignors to Aktiengesellschaft Brown Boveri & Cie, Baden, Switzerland, a joint stock company
Filed Sept. 9, 1969, Ser. No. 856,379
Claims priority, application Switzerland, Oct. 15, 1968, 15392
Int. Cl. H02h *3/00*
U.S. Cl. 317—11 **3 Claims**

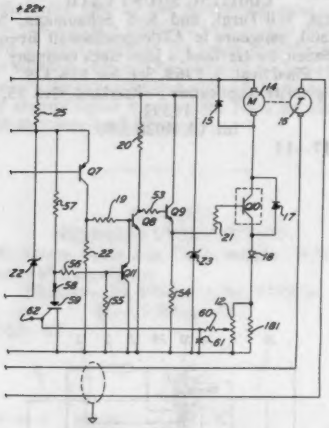


An electrical switching system of the type which includes a main power switching point, an auxiliary switching point connected in parallel with the main switching point through a secondary circuit which includes a series resistance, and a voltage-isolating switching point connected in series with the main switching point. Upon application of a switching-on order, current is caused to flow only through the secondary path containing the series-connected auxiliary switching point and resistance, and also the voltage-isolating switching point which is now closed in order to test the condition of the circuit. If the current flow is abnormally high, the auxiliary switching point is opened and the voltage-isolating switching point is reopened. Thus, there is no current flow through the main power switching point during the test period and this main switching point closes to complete the switching-on order only in the event that the current flow in the circuit is normal.

3,564,337
MOTOR OVERLOAD CONTROL CIRCUIT FOR MATERIAL TESTING MACHINE
William D. Macgeorge, Doylestown, Pa., assignor to Thwing-Albert Instrument Company, Philadelphia, Pa.
Filed Dec. 16, 1968, Ser. No. 783,913
Int. Cl. H02h *7/06*; H02p *5/06*
U.S. Cl. 317—13 **8 Claims**

There is provided a system which is used to control the operation of a material testing machine. The system includes

a circuit which controls the speed of the motor that operates the testing machine and a control circuit which produces a



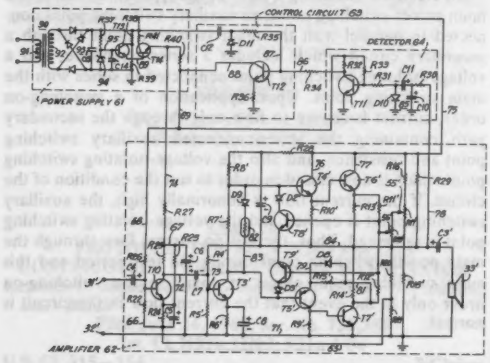
control signal in response to an abnormal load condition whereby the motor can be turned off.

3,564,338

OVERVOLTAGE AND OVERCURRENT PROTECTIVE CIRCUIT FOR A TRANSISTOR AMPLIFIER

Toshihiko Teshirogi, Yokohama-shi, Japan, and Tsutomu Funamizu, Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan, a corporation of Japan

Filed July 31, 1968, Ser. No. 749,179
Claims priority, application Japan, Aug. 3, 1967, 42/49951
Int. Cl. H02h *3/26*
U.S. Cl. 317—31 **7 Claims**



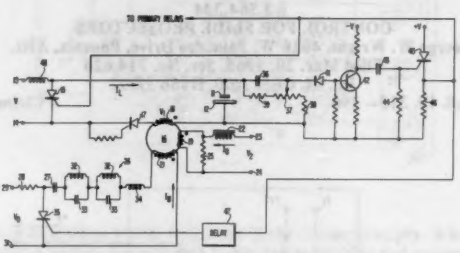
A protective transistor connected in the input of a transistor amplifier is switched to its conductive condition when the difference between a voltage proportionate to the current flowing through the transistor amplifier and a voltage proportionate to the voltage applied to the transistor amplifier reaches a predetermined magnitude. When the protective transistor is switched to its conductive condition, it switches the transistor amplifier to its nonconductive condition.

3,564,339

CIRCUIT FOR RAPID SHUTOFF OF ELECTROCHEMICAL MACHINING APPARATUS

Harold W. Katz and Murray H. Miller, Ann Arbor, Mich., assignors to KMS Industries, Inc., Ann Arbor, Mich., a corporation of Delaware

Filed Oct. 31, 1969, Ser. No. 872,879
Int. Cl. H02h *3/00*
U.S. Cl. 317—33 **11 Claims**



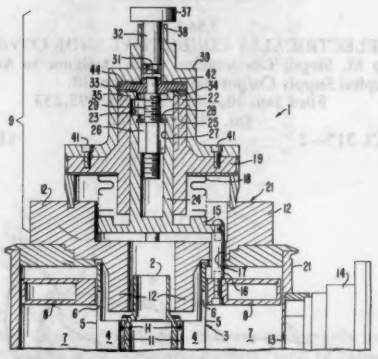
A circuit for the rapid turnoff of the load current in an electrochemical machining apparatus is disclosed. The approach employed is to shunt the load current through an SCR after a short circuit has been detected. The circuit operates to induce an additional voltage in the load circuit to reduce the load current to zero for a sufficient length of time to permit the SCR's in series with the load to recover their blocking capability.

3,564,340

MANUALLY TUNED CROSSED-FIELD TUBE EMPLOYING A FRICTIONALLY LOADED BALL SCREW TUNING ACTUATOR

Peter F. Bahr, Union City, N.J., assignor to Varian Associates, Palo Alto, Calif.

Filed Apr. 3, 1969, Ser. No. 813,000
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.61 **7 Claims**



A crossed-field microwave tube is disclosed. The tube is of the magnetron type, having a circular electric mode resonator coaxially disposed of a microwave anode circuit with the fields of the anode circuit being coupled to the fields of the resonator. A tuning structure is disposed in the coaxial resonator for tuning the operating frequency of the tube. The tuning actuating structure includes a metallic bellows, sealing a movable tuning structure to the remaining portion of the vacuum envelope of the tube. A ball screw structure is disposed externally of the envelope and is coupled to the tuning structure for moving the tuning structure through the bellows. A thrust bearing is disposed between a rotatable portion of the ball screw structure and a fixed position of the

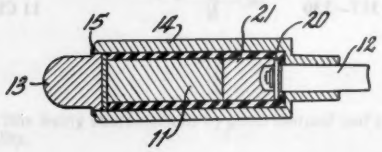
envelope, such bearing member being pressed into engagement by atmospheric pressure exerted on the bellows and which pressure is transmitted as a loading force on the thrust bearing member. The thrust bearing member is selected of a material, such as Teflon, to provide a certain predetermined friction torque loading on the ball screw to prevent inadvertent rotation of the ball screw, while permitting the tuner to be actuated with less than 50 inch ounces of torque manually applied to the rotatable member of the ball screw. A second friction loading thrust bearing member, as of Teflon, is provided to frictionally load the ball screw by vibration forces to prevent inadvertent rotation by vibration of the tube.

3,564,341

PIEZO-ELECTRIC IGNITION DEVICE FOR GAS APPLIANCES AND THE LIKE

Masami Nishiura, 25,12-banchi, Honmachi, Kadoma-shi, Osaka, Japan

Filed Feb. 17, 1969, Ser. No. 799,705
Int. Cl. F23g *3/00, 5/00*
U.S. Cl. 317—81 **3 Claims**



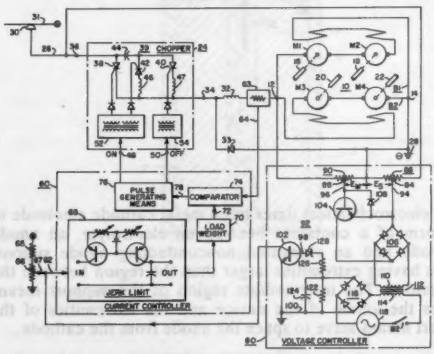
A device for causing piezoelectric spark ignition of gas in gas stoves, appliances, and the like. The device is easily assembled and holds the piezoelectric element and lead wires securely in place.

3,564,342

MOTOR CONTROL SYSTEM

Terry D. Sanders, and Lalan G. Miller, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed May 22, 1969, Ser. No. 826,978
Int. Cl. H02p *1/16*
U.S. Cl. 318—93 **9 Claims**



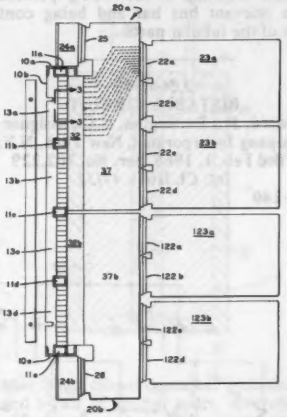
Disclosed is a system for operating a chopper-controlled series-parallel plural motor network, for instance the four traction motors of a vehicle (such as a rapid transit railway car) at a fraction of the line voltage per motor during a starting phase, by controlling the chopper in response to a comparison of the motor voltage and the line voltage thereby to regulate the motor voltage to a desired fraction of the line voltage, for example 25 percent of the line voltage per motor in the four motor case.

3,564,343

COMPUTER PROGRAMMING APPARATUS

Alan J. Guest; Jay B. King, and Edward O. Gilbert, Ann Arbor, Mich., assignors to Reliance Electric Company

Filed Sept. 24, 1968, Ser. No. 767,580
Int. Cl. H02b *1/02;* **H01y** *13/42*
U.S. Cl. 317—101 **16 Claims**



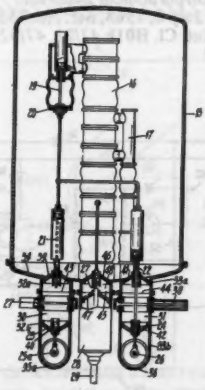
A computer patchbay formed by the front edges of a plurality of etched circuit boards spaced apart from each other in a plurality of planes parallel to each other, with resilient spring contacts adapted to snap on the front edges of the circuit boards and extend forwardly therefrom. Each resilient spring contact includes a cylindrical bar with a plurality of slots which facilitate accurate alignment and uniform alignment of the contacts. Improved techniques for shielding conductors connected to the spring contacts from each other are disclosed.

3,564,344

METAL CLAD SWITCH PLANTS FOR HIGH VOLTAGES

Rintje Boersma, Harmelen, Netherlands, assignor to N. V. COQ, Utrecht, Netherlands, a company of Netherlands

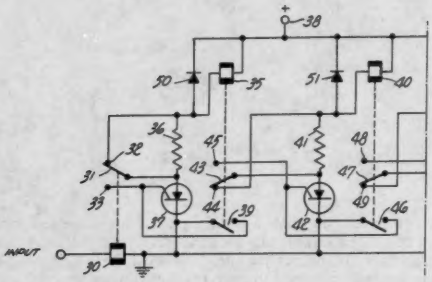
Filed June 5, 1968, Ser. No. 734,782
Claims priority, application Netherlands, June 9, 1967, 6708018
Int. Cl. H02b *1/04;* **H01h** *33/82*
U.S. Cl. 317—103 **4 Claims**



A high voltage system includes at least two horizontal parallel bus bar systems enclosed in metal tubes and switching units connected thereto. The switching units each

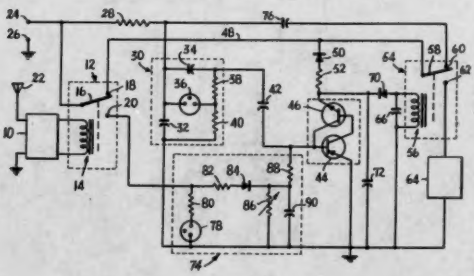
contain at least a circuit breaker and two bus bar isolating switches connected in series therewith and each isolating switch is connected to a bar of the bus bar system. The circuit breaker and the isolating switches are accommodated in a common metal casing which is joined to the metal tubes enclosing the bus bars through the medium of tubular extensions or collars which are joined to tubular parts extending perpendicularly upwardly from the metal tubes, the fixed contact of each isolating switch being permanently connected to the relevant bus bar and being contained in a respective one of the tubular parts.

3,564,345
BISTABLE CIRCUIT
Joseph S. Baynard, Jr., Burlington, N.C., assignor to Western Electric Company Incorporated, New York, N.Y.
Filed Feb. 1, 1968, Ser. No. 702,229
Int. Cl. H01h *47/32*
U.S. Cl. 317—140 **6 Claims**



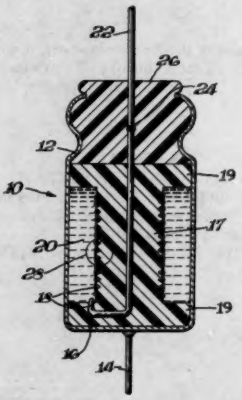
A bistable circuit in which a normally unactuated silicon controlled rectifier is serially connected with a fixed resistor and the coil of a relay. Depression of a control switch forward biases the gate of the rectifier to initiate conduction and the subsequent release of the control switch shorts out the series resistor to actuate the relay. Actuation of the relay connects the control switch across the rectifier and a subsequent depression of the switch stops conduction through the rectifier. Release of the control switch then deactuates the relay.

3,564,346
CONTROL CIRCUIT
Carl E. Atkins, Montclair, N.J., assignor to Wager Electric Corporation, a corporation of Delaware
Filed July 8, 1968, Ser. No. 743,066
Int. Cl. H01h *47/22, 47/32*
U.S. Cl. 317—142 **17 Claims**



A first switch (solid-state or electromagnetic) controls energization and deenergization of a timing circuit which controls the state of a second switch (solid-state) connected in a current path shunting the winding of a load controlling relay. When a predetermined input is provided to the first switch, a capacitor is charged and upon removal of said predetermined input from the first switch, the capacitor discharges and renders the second switch nonconductive, thereby causing the load controlling relay to become energized for a predetermined, variable period of time. A greater part of the discharging period is usable because the firing signal to the second switch is reduced during discharging of the capacitor. In one embodiment, the first switch is maintained conductive during energization of the load by a signal derived from the high side of the load. In another embodiment, the second switch is energized during charging of the capacitor, but a current-limiting resistor is connected in series with the load until the capacitor begins discharging.

3,564,347
ELECTROCHEMICAL TIMER
David B. Peck and Walter W. Schroeder, Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.
Filed Jan. 21, 1969, Ser. No. 792,648
Int. Cl. H01g *9/06*
U.S. Cl. 317—230 **11 Claims**

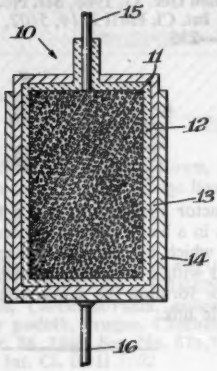


An electrochemical timer has a metal cathode electrode in the form of a container housing an electrolyte, an anode electrode and an elongated nonconducting anode support means having extremities larger than the region between the extremities. The intermediate region of the support means carries the anode of the device and the extremities of the support means serve to space the anode from the cathode.

3,564,348
TITANIUM-ANTIMONY ALLOY ELECTRODE ELECTRICAL CAPACITOR
David M. Cheseldine, Bennington, Vt., assignor to Sprague Electric Company, North Adams, Mass.
Filed Apr. 7, 1969, Ser. No. 814,089
Int. Cl. H01g *9/05*
U.S. Cl. 317—230 **3 Claims**

An electrical capacitor is provided having at least one electrode comprising an alloy of titanium and antimony. An an-

timony concentration of 10 to 30 percent by weight provides an electrode material on which a stable anodic film is grown,



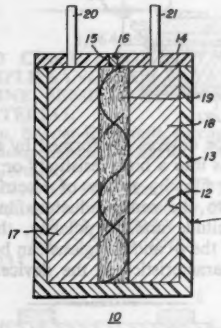
such film being characterized by good thermal and electrical stability.

3,564,349

COULOMETER WITH ELECTRODE CONTAINING EXCESS OF AT LEAST 200 PERCENT CADMIUM HYDROXIDE

Randall N. King, Johnstown, N.Y., assignor to General Electric Company

Filed May 2, 1969, Ser. No. 821,362
Int. Cl. H01g 9/00
U.S. Cl. 317—230 **2 Claims**



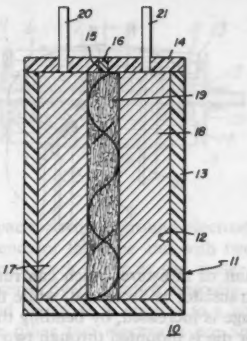
A coulometer has a closed container including an alkaline electrolyte and a pair of spaced apart, reversible electrodes in contact with the electrolyte. Each of the electrodes consists of an inert support, active material on the support, and an electrically conductive lead. One of the electrodes has active material of metallic cadmium in an amount equivalent to the predetermined coulometric capacity of the coulometer, and active material of cadmium hydroxide in an amount of at least 200 percent of the metallic cadmium. The other electrode has active material of mercuric oxide in an amount equivalent to the amount of the metallic cadmium and cadmium hydroxide of the first electrode.

3,564,350

COULOMETER WITH ELECTRODE CONTAINING EXCESS OF AT LEAST 200 PERCENT MERCURIC OXIDE

Randall N. King, Johnstown, and William N. Carson, Jr., Schenectady, N.Y., assignors to General Electric Company

Filed May 2, 1969, Ser. No. 821,445
Int. Cl. H01g 9/00
U.S. Cl. 317—230 **2 Claims**



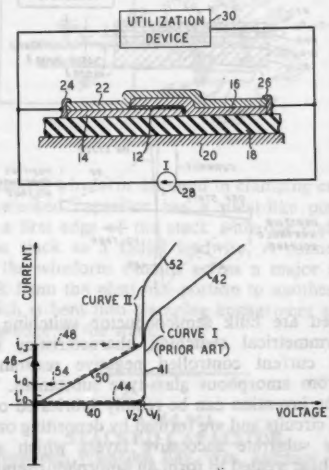
A coulometer has a closed container including an alkaline electrolyte and a pair of spaced apart, reversible electrodes in contact with the electrolyte. Each of the electrodes consists of an inert support, active material on the support, and an electrically conductive lead. One of the electrodes has active material of metallic mercury in an amount equivalent to the predetermined coulometric capacity of the coulometer, and active material of mercuric oxide in an amount of at least 200 percent of the metallic mercury. The other electrode has active material of mercuric oxide in an amount equivalent to the amount of the metallic mercury and mercuric oxide of the first electrode.

3,564,351

SUPERCURRENT DEVICES

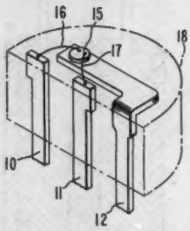
Dean E. McCumber, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 7, 1968, Ser. No. 727,287
Int. Cl. H01l 3/00, 5/02, 5/06
U.S. Cl. 317—234 **19 Claims**



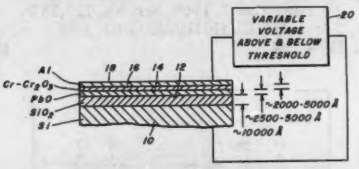
A supercurrent device includes a shunt conductance across an interfacial region having a finite zero voltage current characteristic of, but not limited to, Josephson tunnel junctions. The effect of the conductance is to raise the switchback current to convenient and controllable values and simultaneously to decrease the capacitive time constant associated with the device.

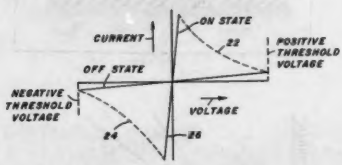
3,564,352
STRIP DESIGN FOR A LOW COST PLASTIC TRANSISTOR
William L. Lehner, Los Altos Hills, Calif., assignor to Fairchild Camera and Instrument Corporation, Syosset, N.Y., a corporation of Delaware
Filed Dec. 30, 1968, Ser. No. 787,945
Int. Cl. H01l 1/14
U.S. Cl. 317—234 6 Claims



The amount of moisture which can reach a plastic encapsulated transistor is decreased, while the heat capacity of the package is increased, by bending the lead on which the transistor die is mounted through two consecutive 90° bends thereby to double the length and mass of this lead within the package and thus to increase the distance moisture must travel along the lead to reach the transistor.

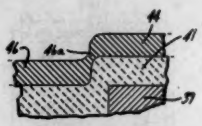
3,564,353
BULK SEMICONDUCTOR SWITCHING DEVICE FORMED FROM AMORPHOUS GLASS TYPE SUBSTANCE AND HAVING SYMMETRICAL SWITCHING CHARACTERISTICS
William S. Corak, Arnold, and David S. Herman, Columbia, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania
Filed Apr. 16, 1969, Ser. No. 816,491
Int. Cl. H01l 9/00, 7/00, 3/00
U.S. Cl. 317—234 14 Claims





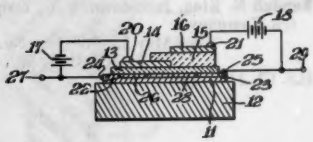
Described are bulk semiconductor switching devices having symmetrical switching characteristics with an associated current controlled negative resistance, and formed from amorphous glass-type substances. The devices of the invention can be readily fabricated on small, integrated circuits and are formed by depositing on a semiconductive substrate successive layers which are subsequently heat treated to form an amorphous semiconductive glass, these layers comprising silicon dioxide, lead oxide and a material selected from the group consisting of chromium-chromium oxide, vanadium-vanadium oxide and molybdenum-molybdenum oxide. Also described is a method for manufacturing such semiconducting glasses.

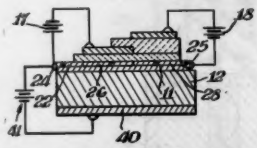
3,564,354
SEMICONDUCTOR STRUCTURE WITH FUSIBLE LINK AND METHOD
Edward Masami Aoki, Cupertino, and David R. Peterson, Palo Alto, Calif., assignors to Signetics Corporation, Sunnyvale, Calif., a corporation of California
Filed Dec. 11, 1968, Ser. No. 783,093
Int. Cl. H01l 1/14, 5/02, 19/00
U.S. Cl. 317—235 13 Claims



Semiconductor structure having a fusible link formed by a portion in a lead structure carried by a semiconductor body in which the portion is characterized in that it can be fused with a relatively precise current level, and a method for forming the semiconductor structure with such a fusible link.

3,564,355
SEMICONDUCTOR DEVICE EMPLOYING A P-N JUNCTION BETWEEN INDUCED P- AND N-REGIONS
Kurt Lehovec, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass., a corporation of Massachusetts
Continuation-in-part of application Ser. No. 703,958, Feb. 8, 1968. This application Aug. 2, 1968, Ser. No. 749,651
Int. Cl. H01l 11/14
U.S. Cl. 317—235 13 Claims



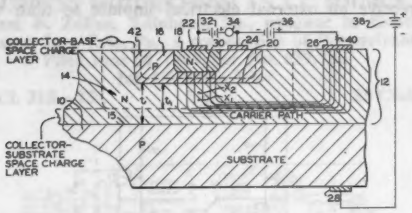


Semiconductor devices are formed by the induction of p- and n-regions into a high resistivity or semi-insulating-semiconducting film by means of electric fields applied perpendicular to the semiconductor film. By changing the field magnitude and/or polarity, the location and conductivity of the p- and n-regions can be varied thereby varying the characteristics of the device.

3,564,356
HIGH VOLTAGE INTEGRATED CIRCUIT TRANSISTOR
George R. Wilson, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg., a corporation of Oregon
Filed Oct. 24, 1968, Ser. No. 770,303
Int. Cl. H01l 5/00
U.S. Cl. 317—235 7 Claims

An integrated circuit transistor includes a substrate and an epitaxially grown semiconductor material thereon providing a three-layer transistor comprising a collector layer, an emitter layer, and a base layer therebetween. The collector layer is characterized by virtually complete depletion of majority carriers at a collector-emitter voltage less than the voltage at which collector-emitter

breakdown would otherwise occur. As a result, the collector-emitter voltage may be increased without encountering normal collector-emitter breakdown, because the field intensity in the collector-base charge layer is limited.

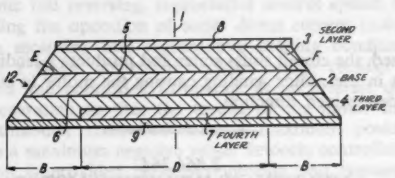


3,564,357

MULTILAYER SEMICONDUCTOR DEVICE WITH REDUCED SURFACE CURRENT

Oto Valcik, Prague, Czechoslovakia, assignor to CKD Praha oborovy podnik, Prague, Czechoslovakia

Filed Mar. 26, 1969, Ser. No. 810,763
Int. Cl. H01l *5/02*
U.S. Cl. 317—235 **8 Claims**



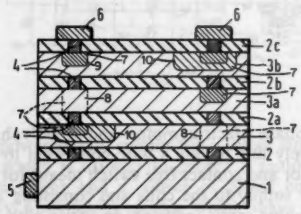
In a monocrystalline semiconductor body a layer of one conductivity type is sandwiched between a pair of adjacent layers of opposite conductivity type. A fourth layer of the one conductivity type having a smaller diameter than any of the other layers is formed in one of the adjacent layers and determines the functional cross section of the device, each of the other layers extending beyond the functional cross section in a peripheral border area.

3,564,358

INTEGRATED CIRCUIT STRUCTURE CONTAINING MULTIPLE SANDWICH LAYERS OF MONOCRYSTALLINE SEMICONDUCTOR AND INSULATOR MATERIAL

Alfons Hähnlein, Nieder-Ramstadt, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany, a corporation of Germany

Filed Nov. 13, 1968, Ser. No. 775,395
Claims priority, application Germany, Nov. 15, 1967, P 15 89 705.9
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 **4 Claims**



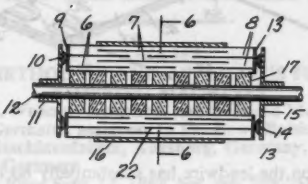
This is an integrated circuit structure having several silicon layers electrically isolated and capacitively decoupled from each succeeding layer by means of intermediate insulating layers of aluminium silicates, said layers being successively deposited on a silicon substrate.

3,564,359

TUBULAR CAPACITOR

Nello Coda, Erie, and Lawrence J. Ruffner, College, Pa., assignors to Erie Technological Products, Inc., Erie, Pa., a corporation of Pennsylvania

Filed Aug. 10, 1967, Ser. No. 659,675
Int. Cl. H01g *1/06*
U.S. Cl. 317—260 **3 Claims**



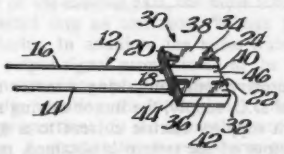
A tubular capacitor with a ground electrode spaced inward from the ends of the tube and with two other electrodes spaced from each other at the center of the tube and extending respectively toward opposite ends of the tube. The ground electrode is applied to a layer of green ceramic and the other two electrodes are applied to another layer of green ceramic and the layers of ceramic are arranged one on top of the other and spirally wrapped a plurality of turns about the axis of the tube. The spiralled turns of the ground electrode are shorted by conductive material in one or more holes through the ceramic between the two other electrodes.

3,564,360

STACKED CAPACITOR

Roger W. Zimmerman, West Bend, Wis., assignor to Sprague Electric Company, North Adams, Mass., a corporation of Massachusetts

Filed June 4, 1969, Ser. No. 830,333
Int. Cl. H01g *1/14*
U.S. Cl. 317—261 **6 Claims**



An integral wireform disposed in clamping engagement with a stacked capacitor has a pleat-like portion bent around a first edge of the stack with one end extended from the stack as a radial leadwire. A connective portion of the wireform extends across a major surface of the stack from the pleat-like portion to another end portion which is bent into clamping engagement around the opposing edge of the stack.

3,564,361

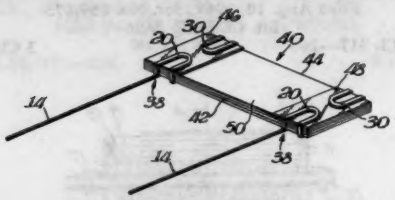
STACKED CAPACITOR

Jack Greenberg, Whitefish Bay, Wis., assignor to Sprague Electric Company, North Adams, Mass., a corporation of Massachusetts

Filed June 30, 1969, Ser. No. 837,552
Int. Cl. H01g *1/14*
U.S. Cl. 317—261 **6 Claims**

An integral wireform provides a folded portion in clamping engagement with a stacked capacitor and an

end portion which extends from the component as a radial leadwire, and said folded portion is arranged such that



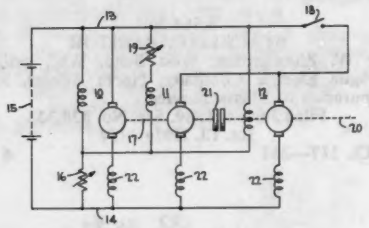
radial pull on the leadwire has substantially no unfolding action on the clamping portion.

3,564,362

ELECTRIC DRIVE UNIT UTILIZING AN M-G SET AS ANOTHER DRIVE UNIT WHEN A CERTAIN SPEED IS ATTAINED

William Frank Hill, Stafford, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England, a British company

Filed Aug. 6, 1968, Ser. No. 750,534
Claims priority, application Great Britain, Aug. 29, 1967, 39,426/67
Int. Cl. H02p *7/68*
U.S. Cl. 318—45 **4 Claims**



An electric drive unit comprising a motor connectible to a source of D.C. supply, the motor driving a generator which in turn supplies electric current to a motor from which the output of the system is obtained, means being provided to control the excitation of the generator and clutch means being provided to effect connection between the shafts of the motors and the generator and switch means being provided to connect the generator and motors across the source of D.C. supply.

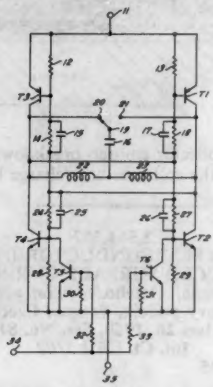
3,564,363

ELECTRIC STEPPING MOTOR CONTROL CIRCUIT

William R. Scholtz, Scotia, N.Y., assignor to Salient Electronics, Inc., Rexford, N.Y., a corporation of New York

Filed Sept. 9, 1968, Ser. No. 758,501
Int. Cl. H02k *37/00*
U.S. Cl. 318—138 **5 Claims**

A bistable circuit for controlling one or more permanent magnet A.C. motors at a synchronous stepping rate includes two pairs of transistors electrically connected to the motor windings which, when energized, produce one of two stable states wherein one pair of transistors is conducting and the second pair is non-conducting. Also included in the circuit are resistors connected between base and emitter of the transistors for controlling voltage input, a phase shifting capacitor connected to the motor windings, switching means for determining the stepping direction of the motors, and a pair of transistors adapted to receive an external electrical impulse so that, when



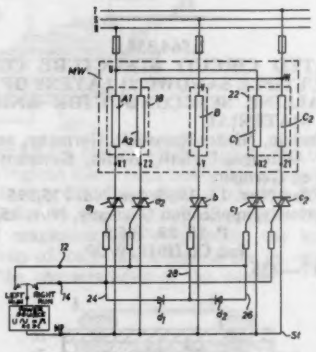
pulsed, the circuit shifts states and produces a leading current in the motor winding causing the motor to step in a predetermined direction.

3,564,364

MULTIPHASE INDUCTION MOTOR

Alfred Neff, Remscheid, Germany, assignor to Gebruder Honsberg, Remscheid-Hasten, Germany

Filed Sept. 16, 1968, Ser. No. 759,868
Claims priority, application Germany, Sept. 15, 1967, P 16 13 936.9
Int. Cl. H02k *17/02*
U.S. Cl. 318—207 **4 Claims**



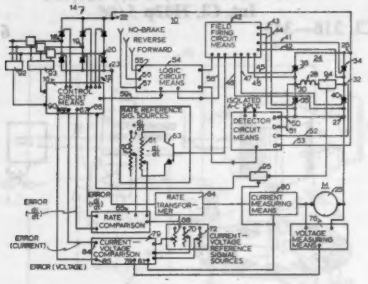
A polyphase electric motor and a polyphase electric power supply line having a wire connected to each phase of the motor and contact free switch means for controlling the energy supply to the coils and consisting of normally non-conductive semiconductors in series with each motor coil. Each semiconductor has a control terminal sensitive to direct current voltage to make it conductive and a supply of direct current for connection to the terminals. By various combinations of coils the motor can be made to run at high speed or low speed and in either forward or reverse direction.

3,564,365

STATIC REGENERATIVE CONTROL OF DIRECT CURRENT MOTORS FROM AN A.C. SOURCE

William B. Zelina, Edinboro, Pa., assignor to General Systems, Inc., Erie, Pa., a corporation of Pennsylvania

Filed June 30, 1969, Ser. No. 837,756
Int. Cl. H02p 3/14
U.S. Cl. 318—251 25 Claims



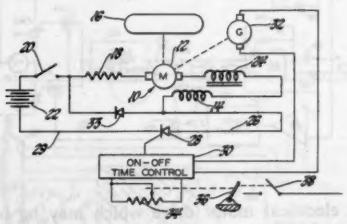
A static full reversing, regenerative control system for controlling the operation of series direct current motors in both motoring and regenerative braking conditions wherein a single controlled rectifier bridge rectifier is employed and controlled to operate as an inverter during regeneration so that the torque of the motor may be continuously controlled from a maximum positive value to a maximum negative value. Smooth, controllable transition is provided between motoring and regenerative braking operating conditions by a static reversible field switching means and maintenance of the direction of current in the motor armature circuit with provision for limiting the motor current, motor voltage and both positive and negative rate-of-change of motor current.

3,564,366

MOTOR CONTROL SYSTEM FOR A DIRECT CURRENT TRACTION MOTOR

William D. Worrell, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed July 2, 1969, Ser. No. 838,508
Int. Cl. H02p 7/28
U.S. Cl. 318—257 11 Claims



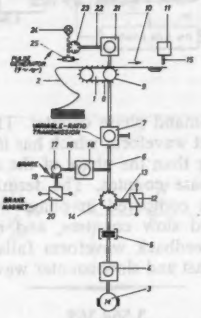
A motor power supply system for a direct current traction motor which is utilized to propel a motor vehicle. The traction motor and a source of direct current are connected by a switching device which takes the form of a silicon controlled rectifier. The "on" and "off" times of the controlled rectifier are programmed such that the "on" time is controlled as a function of motor speed and increases as motor speed increases. The "off" time for the controlled rectifier is controlled as a function of the setting of an accelerator pedal for controlling the vehicle and as the accelerator pedal is depressed the "off" time of the controlled rectifier decreases. The system, in addition to the control circuit that has been described, includes a torque limit circuit, a speed limit circuit, a fault sensing circuit and an arrangement for preventing the vehicle from being shifted from a forward condition of movement to a reverse condition of movement or vice versa whenever the propulsion motor has a speed which is higher than a predetermined value.

3,564,367

METHOD OF AND APPARATUS FOR STOPPING MACHINES

Rudolf H. Wanner, Aystetten, and Berthold Mader, Augsburg, Germany, assignors to Fa. Bowe Bohler & Weber KG. Maschinenfabrik, Augsburg, Germany, a corporation of Germany

Filed Sept. 13, 1968, Ser. No. 759,551
Claims priority, application Germany, Sept. 15, 1967, P 15 88 074.7
Int. Cl. H02p 3/16
U.S. Cl. 318—275 4 Claims



A system for braking a moving machine part in which a pulse train is generated at a frequency proportional to the velocity of the moving part, the pulse train frequency being converted into an analogous voltage proportional to such velocity. In addition, the pulse train is used to provide an output signal proportional to the distance between the instantaneous position and the desired stopping point by pulse counting, the latter signal being converted to a signal proportional to the square root of the remaining distance. A comparator is responsive to the analog signal proportional to pulse frequency and velocity and to the root signal proportional to the square root of the residual distance to provide a difference signal in accordance with which the braking of the machine part is regulated.

3,564,368

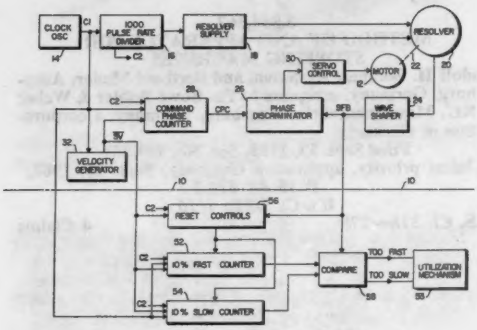
SPINDLE SPEED CONTROL MONITOR

Leroy U. C. Kelling, Waynesboro, Va., assignor to General Electric Company, a corporation of New York

Filed Jan. 10, 1968, Ser. No. 696,795
Int. Cl. H02p 5/06
U.S. Cl. 318—314 11 Claims

The feedback waveform in a closed loop position controlling system for controlling the speed of a spindle is used to generate an envelope waveform which sets the limits of the system response. In the closed loop position controlling system, the speed of the spindle motor is controlled by a train of velocity pulses. The velocity pulses are accumulated by a command phase counter whose output phase is compared with the phase of a feedback waveform whose phase is related to the spindle motor rotational position. The phase difference drives the motor

in a direction to reduce the phase difference to zero. At the start of each spindle speed monitoring cycle, a fast and slow phase counter are cleared, preset and started counting by one of the feedback pulses. The presetting operation causes the initial phase preset of these counters to straddle the phase of the feedback pulse. The fast counter provides an output waveform which has its phase advancing slightly faster than the phase of the output



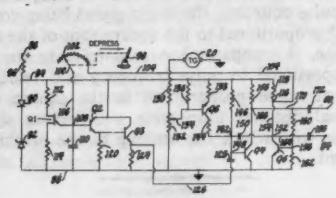
signal of the command phase counter. The slow counter provides an output waveform which has its phase advancing slightly slower than the phase of the output signal of the command phase counter. The termination of each feedback pulse is compared in phase with the outputs from the fast and slow counters, and an indication is provided if the feedback waveform falls outside of the limits set by the fast and slow counter waveforms.

3,564,369

MOTOR CONTROL SYSTEM FOR A DIRECT CURRENT TRACTION MOTOR

Gerald O. Huntzinger and Donald O. Ruff, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed July 2, 1969, Ser. No. 838,509
Int. Cl. H02p 7/28
U.S. Cl. 318—327 **7 Claims**



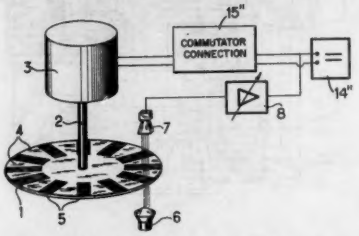
A motor power supply system for a direct current traction motor which is coupled to the wheel of a motor vehicle to provide motive power for the vehicle. The traction motor is connected with a source of direct current through a switching device which takes the form of a silicon controlled rectifier. The controlled rectifier is switched alternately on and off and the time duration of the on and off periods of the controlled rectifier is controlled such that the on time is increased as motor speed increases. The time duration of the nonconducting periods, or off times of the controlled rectifier, is controlled as a function of the setting of an accelerator pedal for controlling the speed of the vehicle and as the accelerator pedal is depressed the off time is decreased.

3,564,370

APPARATUS FOR REGULATING THE SPEED OF LOW SPEED ELECTRIC COMMUTATOR MOTORS THROUGH THE USE OF SYNCHRONIZED BOOSTING SIGNALS

Jean-Michel Catherin, Savigny-sur-Orge, France, assignor to Compagnie Generale d'Electricite, Paris, France, a French corporation

Filed May 20, 1968, Ser. No. 730,531
Claims priority, application France, May 19, 1967, 107,050; June 16, 1967, 110,796
Int. Cl. H02p 5/06
U.S. Cl. 318—343 **6 Claims**



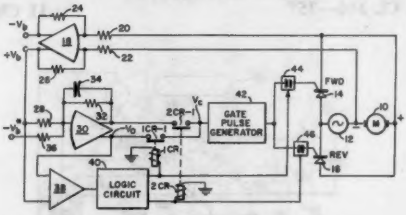
A device for eliminating the speed fluctuation of low speed electric motor due to the simultaneous passage of plural commutator segments under the motor's brushes, which causes the motor's impedance to be periodically lowered which, in turn, causes a fluctuation in input voltage to the motor and a corresponding fluctuation in motor speed. The device is coupled to the motor shaft and acts on the supply current to the motor to produce a voltage fluctuation which is of the same frequency and amplitude as that due to lowered motor impedance, and in phase opposition thereto.

3,564,371

DUAL CONVERTER HAVING SHARED GATE PULSE GENERATOR

Emil T. Schonholzer, 119 Lee St., Depew, N.Y. 14043

Filed Nov. 13, 1968, Ser. No. 775,358
Int. Cl. H02p 5/16
U.S. Cl. 318—345 **6 Claims**



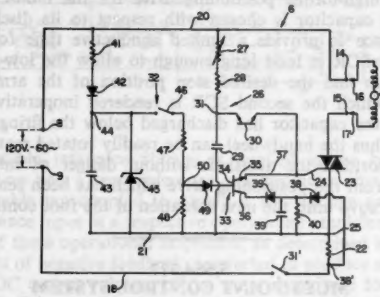
An electrical motor drive which may be operated in the forward or reverse direction and which is supplied from a power unit having a first set of thyristors for supplying current in the forward direction and a second set of thyristors for supplying current in the reverse direction, and wherein a common gate pulse generator is selectively connected by a switching relay to the forward or reverse set of thyristors depending upon the direction of rotation desired. The switching relay, in turn, is controlled by a comparsion of the bus voltage from the motor with the output voltage of a voltage controller for the motor. In this manner, the deadband between the forward and reverse conduction modes is minimized.

3,564,372

ELECTRICAL POWER CONTROL MEANS

Walter H. Vogelsberg, Radnor, Pa., and Alexander C. R. Wilson, Towson, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md., a corporation of Maryland

Filed Nov. 29, 1968, Ser. No. 779,991
Int. Cl. H02p 7/28
U.S. Cl. 318—345 15 Claims



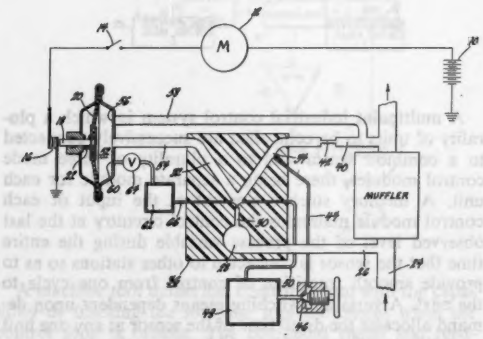
An electrical power control circuit for a load which provides for selective application of power in excess of the normal power to the load. In the preferred embodiment, the load is a motor and the application of additional power is manually controlled and provides greater power output of the motor so a tool powered by the motor will continue to operate even though the load on the tool would normally stall the motor. The additional power is automatically cut back by the control circuit before damage to the motor can occur. In the preferred embodiment, the motor drives a portable power tool and power to the motor is controlled by varying the firing angle of a triac in series with the motor.

3,564,373

PULSE CONTROL WIPER

Keith H. Carpenter, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed Dec. 23, 1965, Ser. No. 515,855
Int. Cl. H02p 1/04
U.S. Cl. 318—443 3 Claims



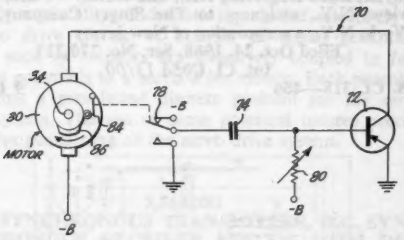
In a preferred form, this disclosure relates to a pulse type windshield wiping system for wiping the windshield of a vehicle. The system includes a drive motor which is adapted to be intermittently energized for moving windshield wipers across the windshield through one cycle of operation each time it is energized. The system further includes a switch means in an electric circuit with the motor for controlling energization and de-energization thereof, a pressure responsive means operable to effect movement of a switch element of the switch means to closed and open positions in response to pressurized exhaust gases from the engine being supplied and not supplied thereto, respectively, and a fluid amplifier means for directing the exhaust gases to the pressure responsive means at periodic intervals whereby the drive motor is caused to be intermittently energized.

3,564,374

INTERMITTENT CONTROL DEVICE

Robert W. Kearns, Detroit, Mich., assignor, by mesne assignments, to Tann Company, Detroit, Mich., a partnership of Michigan

Original application Dec. 1, 1964, Ser. No. 414,973, now Patent No. 3,351,836, dated Nov. 17, 1967. Divided and this application Sept. 21, 1967, Ser. No. 669,616
The portion of the term of the patent subsequent to Nov. 7, 1984, has been disclaimed
Int. Cl. H02p 7/06
U.S. Cl. 318—443 18 Claims



A windshield wiper control which operates the wiper blades continuously or intermittently with a dwell period between each wiping cycle. In the intermittent operation the wiper blades are responsive to the condition of the windshield. Transistors are provided for controlling the intermittent operation and also for controlling the continuous mode of operation. In the intermittent mode of operation, the time interval of the dwell periods can be varied between zero and a predetermined maximum time interval so that when the dwell periods are set at zero the wiper blades operate continuously. The length of time of the dwell periods is determined by a capacitive timing control in which the capacitor is charged by the battery of the automotive vehicle and thereafter is connected in an RC circuit in a manner to apply to the resistance of the RC circuit a potential greater than the battery voltage.

3,564,375

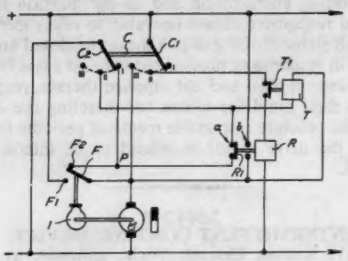
CONTROL SYSTEM FOR ELECTRIC WINDSHIELD WIPERS HAVING DYNAMIC BRAKING DEFINED BY SHORT CIRCUIT

Eugenio Allaria, Milan, Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Milan, Italy, a corporation of Italy

Filed Oct. 24, 1967, Ser. No. 677,694
Claims priority, application Italy, Oct. 26, 1966, 29,294/66
Int. Cl. B60s 1/08
U.S. Cl. 318—443 6 Claims

A windshield wiper control system of motor vehicles comprises members provided for the electric braking of the operating motor including switches, controlled by a

manual change-over switch which controls the operation of an electric motor. In the case of motors of the perma-



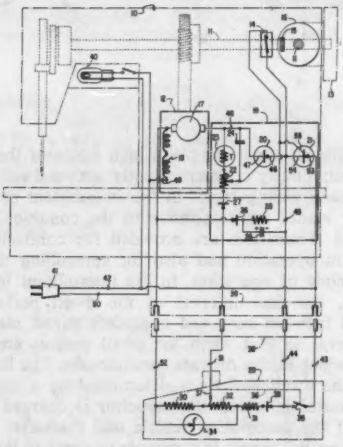
nent magnet excitation-type the electric braking is obtained by short circuiting the rotor of the motor.

3,564,376

TIME DELAY ARMSHAFT POSITIONING CONTROL SYSTEM FOR SEWING MACHINE

James W. Mais, Washington, D.C., George M. Nicholayeff, Lake Rogerene, N.J., and Donny V. Lee, Plainview, N.Y., assignors to The Singer Company, New York, N.Y., a corporation of New Jersey

Filed Oct. 24, 1968, Ser. No. 770,211
Int. Cl. C05d *13/00*
U.S. Cl. 318—466 9 Claims



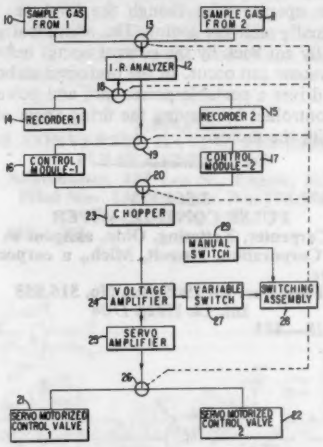
A circuit is disclosed for automatically, driving a sewing machine to a predetermined position of the armshaft responsively to the normal relaxation of the foot controller. Two silicon controlled rectifiers (SCR's) are employed. One SCR controls the range of motor speeds by variable gate voltages supplied thereto by a foot controller-actuated resistance. A switch supplying A.C. line voltage to the speed control circuit is normally open in the relaxed position of the controller but is closed responsively to initial actuation of the controller. This switch is connected in shunt with the anode-cathode circuit of a second SCR which may be maintained conductive only for a predetermined time after the switch is opened. This conductive time is established by a timing capacitor which is charged through a diode only when the switch is closed, and is discharged into the gate of the second SCR when the switch is opened. A normally-open reed switch is positioned to be influenced by a small permanent magnet mounted on the handwheel which is coupled to the armshaft and closure of this switch is thus effected in a predetermined position of the handwheel. The reed switch is connected across the gate-cathode circuit of the second SCR and, when closed, removes the gate voltage to turn off the SCR and stop the motor. The relaxed position of the foot controller provides a minimum resistance for establishing a fixed low-speed high-torque positioning drive for the motor. The timing capacitor is chosen with respect to its discharge resistance to provide a limited conductive time for the second SCR at least long enough to allow the low-speed drive to find the desired stop position of the armshaft after which the second SCR is rendered inoperative because the capacitor has discharged below the firing voltage. Thus the handwheel can be readily rotated manually to reposition the armshaft without danger of interference from the positioning drive which has been rendered inoperative until the next actuation of the foot controller.

3,564,377

MULTIPOINT CONTROL SYSTEM

Richard E. Evans, Fort Lauderdale, Fla., and Frederick W. Roberts, Southport, Conn., assignors to Rolock Incorporated, Fairfield, Conn., a corporation of Connecticut

Filed Oct. 6, 1967, Ser. No. 673,466
Int. Cl. G05b *11/18, 11/32*
U.S. Cl. 318—562 22 Claims



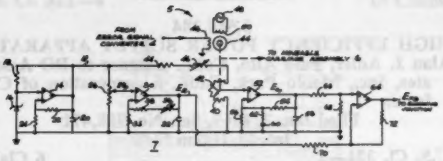
A multipoint industrial control system in which a plurality of units to be controlled are successively connected to a common sensor and to a plurality of three mode control modules, there being a separate module for each unit. A memory storage element at the input of each control module maintains the control circuitry at the last observed level of the process variable during the entire time that the sensor is connected to other stations so as to provide smooth transition of control from one cycle to the next. A variable switching means dependent upon demand allocates the dwell time of the sensor at any one unit or station to the demand or need for correction of the process variable. An overriding timing circuit effects switching of the control apparatus after a predetermined dwell of the sensor at any one station, thereby preventing undue dwell or locking of the sensor at a station.

3,564,378

ACTIVE FEEDBACK NETWORK FOR ANALOGUE PLOTTER SERVO SYSTEM

Charles E. Engle, Tustin, Calif., assignor to Valtec Corporation, a corporation of California

Filed Aug. 8, 1969, Ser. No. 848,498
Int. Cl. G05b 5/01, 19/36
U.S. Cl. 318—576 6 Claims



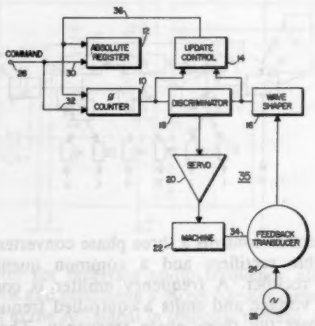
A stable reference voltage is applied across both a follow-up and a zero reference potentiometer that have a movable tap coupled to supply a DC voltage to high impedance input of a respective operational amplifier. The gain of these operational amplifiers, as determined by the amount of negative feedback, is selected to produce steady state DC output voltages of the same magnitude for any given position setting along the selected coordinate axis. The negative feedback path for the operational amplifier coupled to receive the voltage from the tap on the follow-up potentiometer contains an RC delay network that provides a phase lead effect at its output for preventing overshoot. The operational amplifier output voltages are applied to opposite inputs of another operational amplifier coupled in a grounded resistance bridge arrangement to develop a feedback voltage for comparison at a summing junction with a position input signal to generate an error signal for driving the servo motor.

3,564,379

AUTOMATIC POSITION INSPECTOR

Joseph F. Bakel, Lyndhurst, and Brinley A. Gyorko, Waynesboro, Va., assignors to General Electric Company, a corporation of New York

Continuation of application Ser. No. 659,728, Aug. 10, 1967. This application July 2, 1969, Ser. No. 842,797
Int. Cl. G05b 19/28
U.S. Cl. 318—603 20 Claims



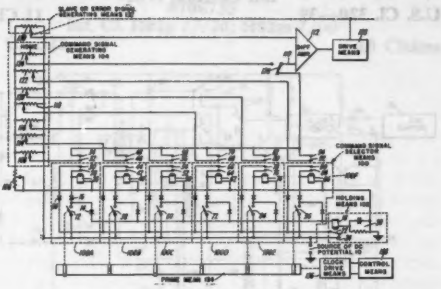
A machine tool numerical control system with the capability of tracking the machine tool movement when the control loop is broken. The command signal and feedback signal are compared and the error is used to update the absolute position register and also the command signal itself. When the control loop is again in operation there is substantially no discrepancy between the electronic equipment indicating position and actual position.

3,564,380

SELECTIVELY SEQUENTIALLY POSITIONING CONTROL

Maurice I. Zeldman, Norwalk, Conn., assignor to American Machine & Foundry Company, a corporation of New Jersey

Continuation of application Ser. No. 626,082, Mar. 27, 1967. This application Jan. 29, 1970, Ser. No. 7,364
Int. Cl. G05b 11/01
U.S. Cl. 318—663 8 Claims



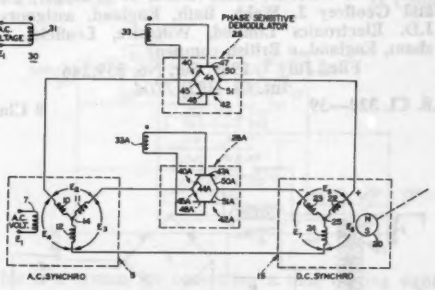
A device for programming a servo drive system, particularly a plurality of discrete signals fed selectively to a servo drive system. A number of signal generating means such as resistors are selectively coupled to feed discrete potentials to a servo drive system. Each potential represents a preselected discrete position for the servo drive system. The use of same potential insures precise repetitive positioning of the servo drive system.

3,564,381

A.C. SYNCHRONOUS TRANSMITTER, D.C. SYNCHRONOUS RECEIVER SYSTEM WITH DEMODULATORS IN ONLY TWO OF THE THREE WINDINGS

Walter Parfomak, Wallington, and Leon Tysko, Fairlawn, N.J., assignors to The Bendix Corporation, a corporation of Delaware

Filed Dec. 19, 1968, Ser. No. 785,137
Int. Cl. G05b 11/12
U.S. Cl. 318—23.5 8 Claims

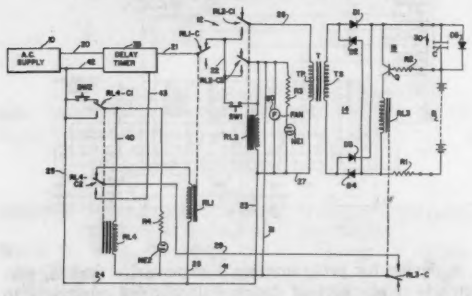


An indicating system having alternating current synchro transmitters providing alternating current signals corresponding to a condition, each transmitter has three stator windings connected back to back with a direct current synchro receiver having three stator windings. Demodulators are connected in two of the back to back connections. The demodulators comprise a pair of transistors of opposite conductivity type controlled by an alternating current voltage phase related to the alternating current signals.

3,564,382
COULOMETER CONTROLLED BATTERY CHARGERS

Thomas Elston King, Ronald Lloyd Haines, and Howard Robert Braun, Ottawa, Ontario, and Ronald Denis Ouellette, Windsor, Ontario, Canada, and Jack Rodney McKague, Baden, Sollingen, Germany, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence

Filed Sept. 13, 1968, Ser. No. 760,746
Claims priority, application Canada, Sept. 15, 1967, 144
Int. Cl. H02j 7/02
U.S. Cl. 320—39 **11 Claims**

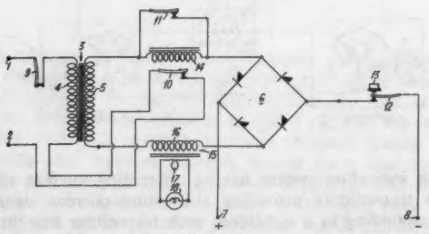


Battery charging circuits using a coulometer in series with the battery to sense the amount of charge going into or out of the battery. The coulometer provides an abrupt rise in voltage upon passage of a predetermined net amount of charge therethrough, e.g. when the battery has been fully charged. This voltage actuates means to terminate further charging either by tripping a relay or deactivating a unijunction oscillator which normally provides gating pulses to an SCR in series with the battery and coulometer. Means are provided for causing a timed overcharge or an intermittent pulse type of overcharge.

3,564,383
BATTERY CHARGER UTILIZING BIMETALLIC SWITCH FOR AUTOMATIC SELECTION OF 6- OR 12-VOLT CHARGING

Frederick C. Wheeler, Bath, Arthur J. S. Seager, Calne, and Geoffrey J. Webb, Bath, England, assignors to J.D. Electronics Limited, Wiltshire, Leafield, Corsham, England, a British company

Filed July 7, 1969, Ser. No. 839,246
Int. Cl. H02j 7/04
U.S. Cl. 320—39 **8 Claims**

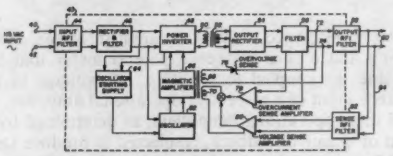


A battery charger for charging 6- and 12-volt batteries includes a two-position charging voltage selection switch and a device which, in response to the charging current, produces either a thermal or an electromagnetic effect which, if the charging current exceeds a particular value above the normal value, causes the switch to switch to the six-volt position. The construction or arrangement of the switch causes it to subsequently remain in this position. Voltage selection may therefore be achieved automatically in dependence on the voltage of the battery under charge.

3,564,384
HIGH EFFICIENCY POWER SUPPLY APPARATUS

Alan J. Adler, Palo Alto, Calif., assignor to RO Associates, Inc., Menlo Park, Calif., a corporation of California

Filed Jan. 2, 1969, Ser. No. 788,471
Int. Cl. H02m 5/40
U.S. Cl. 321—2 **6 Claims**

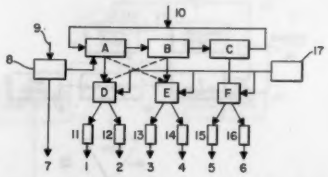


A high efficiency power supply apparatus wherein the duty cycle of the power inverter is varied in accordance with the actual load conditions of the output circuit. A magnetic amplifier, which is responsive to an overvoltage sense detector, an overcurrent sense detector and a load voltage sense detector, is used to control the duty cycle of the power inverter by altering the waveform of the oscillator which is used to drive the power inverter.

3,564,385
GENERATOR FOR PRODUCING CONTROL SIGNALS FOR STRIKING THE CONTROLLABLE RECTIFIERS OF AN INVERTED CONVERTER

Flemming Thorsoe, Augustenborg, Denmark, assignor to Danfoss A/S Nordborg, Denmark, a company of Denmark

Filed Jan. 21, 1969, Ser. No. 792,685
Claims priority, application Germany, Jan. 17, 1968, P 16 13 769.2
Int. Cl. H02m 7/00
U.S. Cl. 321—5 **10 Claims**



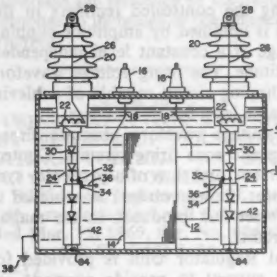
A generator controls a three phase converter having six controllable rectifiers and a common quenching controllable rectifier. A frequency emitter is controlled by an input voltage and emits a controlled frequency which is six times the three phase frequency. The frequency emitter controls the common quenching rectifier and also controls a three stage annular counter. The three outputs of the annular counter control three bistable multivibrator frequency dividers, each having two outputs. The output of each frequency divider is connected to a gate circuit which in turn controls one of the six controllable rectifiers. A correction circuit interconnects the three multivibrators to insure the proper sequency of firing of the six controllable rectifiers.

3,564,386

POWER SUPPLY FOR CONVERTING HIGH VOLTAGE ALTERNATING CURRENT INTO HIGH VOLTAGE DIRECT CURRENT

Merrill G. Leonard, Fowler, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Dec. 27, 1968, Ser. No. 787,346
Int. Cl. H01b 17/00; H02m 7/00
U.S. Cl. 321—8 10 Claims



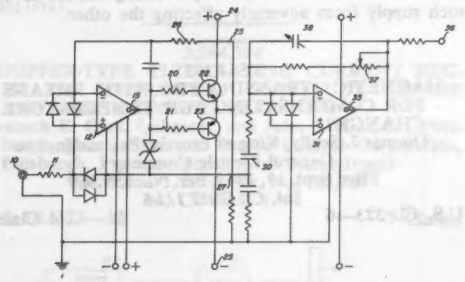
A power supply for converting high voltage alternating current into high voltage direct current comprising a tank having a transformer therein. Bushings extending through the tank for connecting a power source to the transformer. High voltage bushings extending through the tank for connecting a direct current load to the power supply. Each of the high voltage bushings has attached thereto a terminal for connecting to a load, a choke coil, and a rectifier stack. The rectifier stacks extend into the tank and alternating current connections from the transformer and direct current connections to the lower end of the rectifier stacks are automatically made when the rectifier stacks are inserted into the tank.

3,564,387

AC/DC CONVERTER

Richard E. Gadberry, Mesa, Ariz., assignor to Dickson Electronics Corporation, a corporation of Arizona

Filed June 19, 1969, Ser. No. 834,676
Int. Cl. H02m 7/00; H03k 5/00
U.S. Cl. 321—8 7 Claims



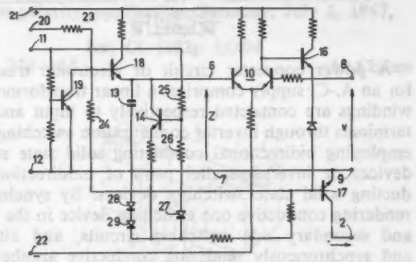
A converter for receiving audio frequency alternating current signals and producing a direct current output signal proportional to the AC signal in response thereto. An operational amplifier is direct connected to receive the AC signal and is provided with a feedback arrangement in a bootstrapping configuration. The output of the bootstrapped operational amplifier is applied through a coupling capacitor to a second operational amplifier that may have a desired gain greater than unity. The signal thus applied at the input of the converter is utilized by the first operational amplifier to drive the capacitor coupling succeeding stages; the output of the second operational amplifier is rectified and integrated to produce a DC analogue quantity proportional to the AC audio frequency amplitude applied to the converter.

3,564,388

CONTROL CIRCUIT ARRANGEMENT FOR CONTROLLED RECTIFIERS

Jean Marie Nolf, Forst, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1968, Ser. No. 727,311
Claims priority, application Netherlands, May 13, 1967, 6706733
Int. Cl. H02p 13/26; H02m 7/00
U.S. Cl. 321—18 10 Claims



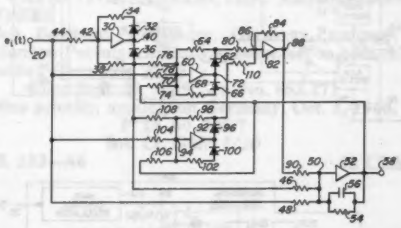
A system for regulating the voltage to a load as a linear function of an input signal comprises a controlled rectifier in series with the load and a source of full wave rectified AC voltage. A control circuit is connected to the rectifier gate electrode to control the firing angle as a function of said input signal. The control circuit includes a comparator to which is applied the input signal and a cosinusoidal sawtooth signal in synchronism with the rectified AC pulses, the amplitude thereof being directly proportional to the amplitude of the rectified AC pulses and starting from the zero level of the input signal. Upon equality of the two signals, the comparator supplys a control signal to the rectifier gate electrode.

3,564,389

AC TO DC CONVERTER

Peter L. Richman, 22 Barberry Road, Lexington, Mass. 40503

Filed May 16, 1969, Ser. No. 825,344
Int. Cl. H02m 7/00
U.S. Cl. 321—18 21 Claims

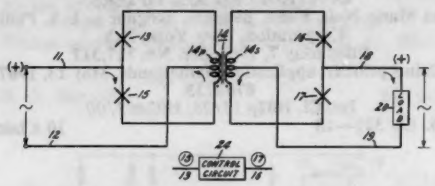


This is a system for converting a time-varying signal into a substantially steady-state output typically the RMS value of the original signal. The system includes a circuit for providing the absolute value of the input signal, and a gain circuit which provides a gain directly proportional to the absolute value and inversely proportional to the RMS value. The output of the latter is then averaged to provide RMS. Preferably, the gain circuit operates by clipping proportioned or scaled absolute signals at a plurality of levels determined as proportions of the steady-state output, and the resulting clipped values are summed together.

3,564,390
POWER CONVERTER CIRCUIT OPERATING AS AN ELECTRIC POTENTIAL TRANSFORMER

Jerry L. Stratton, Schenectady, N.Y., assignor to General Electric Company, a corporation of New York

Filed Apr. 16, 1968, Ser. No. 721,643
Int. Cl. H02m 5/22
U.S. Cl. 321—60 1 Claim

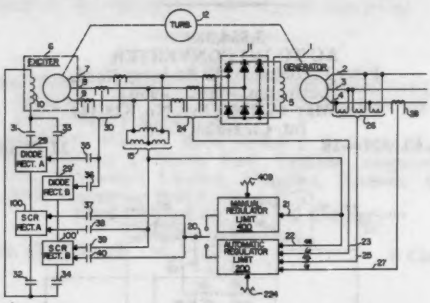


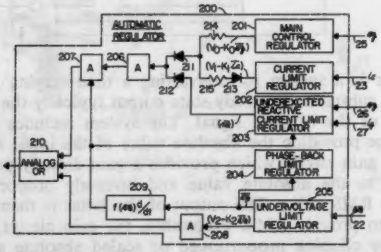
A power converter circuit or electronic transformer for an A.-C. supply comprises a linear transformer whose windings are connected respectively to input and output terminals through inverter configuration switching circuits employing bidirectional conducting solid state switching devices or inverse-parallel pairs of unidirectional conducting solid state switching devices. By synchronously rendering conductive one switching device in the primary and secondary side switching circuits, and alternately and synchronously rendering conductive another device in each circuit at a switching rate substantially higher than the supply frequency, the input potential is converted to a higher frequency wave, transformed, and reconstructed at the output terminals. In this way the size of the transformer is reduced.

3,564,391
ROTATING ALTERNATING CURRENT GENERATOR SYSTEM

Edward H. Dinger, Waynesboro, Va., assignor to General Electric Company

Filed May 9, 1968, Ser. No. 727,783
Int. Cl. H02p 9/30
U.S. Cl. 322—25 34 Claims





A rotating, alternating current generator system is described in which an exciter driven with the generator shaft supplies generator field current as well as the entire field current required by the exciter. D-C field current for the exciter is obtained from the exciter output, rectified by a controlled rectifier unit. Regulation of generator output voltage (or some other variable measurable in the system as a voltage or current) is obtained through control of the firing angle of the controlled rectifier unit, thereby varying the level of exciter field current to adjust for changes in generator output conditions.

To obtain regulation over a wide range of exciter output voltages containing substantial distortion, firing voltage for firing the controlled rectifiers in the controlled rectifier unit is obtained by amplitude-clipping the exciter output voltage at a constant level independent of exciter output amplitude. The firing voltage waveform generator contains a clipping circuit capable of achieving such clipping to the same level for all rectifiers.

The firing voltage waveform generator fires the rectifiers through magnetic core firing circuits. Control of the exciter field current, and thus of a particular system variable (e.g., generator output voltage) is achieved through control of the reset flux produced in the magnetic cores in the firing circuits.

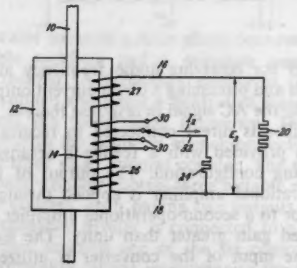
A Manual Regulator Unit is provided for regulating exciter field current to provide constant exciter output voltage. An Automatic Regulator Unit is provided for regulating exciter field current to provide constant generator output voltage. The Automatic Regulator Unit, which includes a non-linear rate feedback loop, includes several regulators, each responsive to a particular system variable for controlling exciter field current in accordance with that variable when its value goes beyond certain predetermined limits, in order to prevent system failure. The individual regulators are connected to control the rectifier unit through an analog OR-gate which passes only that regulator output signal having the greatest amplitude. The regulators in the Automatic Regulator Unit are: (1) the Main Control Regulator; (2) the Undervoltage Limit Regulator; (3) the Current Limit Regulator; (4) the Underexcited Reactive Current Limit Regulator; and (5) the Phase-Back Limit Regulator.

For preventing collapse of exciter self-excitation, a Current Boost Rectifier Unit is provided for maintaining minimum exciter field current under predetermined conditions which otherwise might result in such collapse. Particularly high reliability is achieved by providing two independent exciter field current supplies and by providing a selective failure circuit for preventing failure in one such supply from adversely affecting the other.

3,564,392
MAGNETIC TRANSDUCER WITH MEANS FOR COMPENSATING FOR TEMPERATURE CHANGES

Thomas J. Scully, King of Prussia, Pa., assignor to General Electric Company

Filed Sept. 19, 1969, Ser. No. 859,369
Int. Cl. G05f 1/14
U.S. Cl. 323—6 4 Claims



A magnetic transducer comprising a primary winding, a core of magnetizable material linked thereto, and a sec-

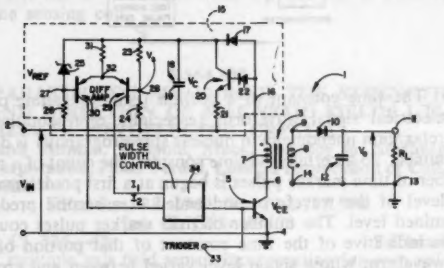
ondary winding linked to the core and having a high impedance connected thereacross across which a voltage signal proportional to primary current is developed. Across a portion only of the secondary winding, a temperature-insensitive resistor of relatively low ohmic value compared to that of the high impedance is connected. Current induced in the loop circuit comprising said secondary winding portion and the resistor connected thereacross produces a voltage drop across the secondary winding portion that counteracts the tendency of the voltage signal to increase in response to increases in the temperature of the secondary winding.

3,564,393

CIRCUIT USING CAPACITOR AND SWITCH ON PRIMARY WINDING OF TRANSFORMER FOR REGULATING VOLTAGE ON SECONDARY WINDING OF TRANSFORMER

James A. Williamson, Fullerton, Calif., assignor to North American Rockwell Corporation

Filed Mar. 12, 1969, Ser. No. 806,484
Int. Cl. G05f *1/56*
U.S. Cl. 323—17 4 Claims



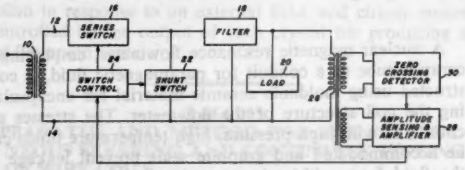
A system detects changes in the output voltage on the input side of a transformer used by the system and generates a control signal in response to the change for changing the power transferred to the output side of the transformer. The input and output have ground isolation. As a result of controlling the power transferred to the output side, the output voltage is maintained at a constant level.

3,564,394

CHOPPER-TYPE ALTERNATING CURRENT REGULATOR EMPLOYING AMPLITUDE SENSOR AND ZERO CROSSING DETECTOR

Kenneth E. Opal, Oakmont, and John S. Hess, Jr., Pittsburgh, Pa., assignors to Power Control Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Jan. 3, 1969, Ser. No. 788,789
Int. Cl. G05f *1/44*
U.S. Cl. 323—22 7 Claims



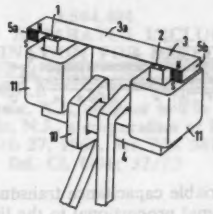
A fast response time voltage regulator which will maintain the amplitude of an alternating current voltage constant over a relatively wide range of frequencies. This is accomplished by chopping the input alternating current voltage at a frequency much higher than that of the alternating current voltage to be regulated, and thereafter filtering the chopper waveform to reconstruct a true sine wave. By sensing the amplitude of the filtered output and by varying the "ON" and "OFF" times of the chopper as a function of variations in amplitude, said amplitude can be maintained constant.

3,564,395

DIRECT-CURRENT TRANSFORMER HAVING A SINGLE COMMON MAGNETIC CIRCUIT

Hans Hieronymus and Hans Martens, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed June 28, 1968, Ser. No. 741,161
Claims priority, application Germany, July 1, 1967, S 110,634
Int. Cl. H02p *13/04*
U.S. Cl. 323—44 10 Claims



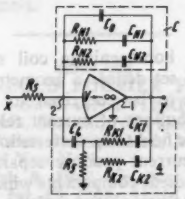
A device for transforming direct current comprises a single magnetic circuit which has a variable magnetic field in which the galvanomagnetic resistance members of a bridge network are located. The magnetic circuit has winding means for providing the controlling field excitation in dependence upon the direct current to be transformed. A direct-current amplifier has its input connected to the bridge network and has its output circuit in negative feedback connection with the winding means to provide the magnetic circuit with feedback excitation opposed to the controlling excitation. The magnetic circuit is at least in part magnetically saturable at magnitudes of the feedback excitation above predetermined limit value.

3,564,396

FOUR-POLE NETWORK EMPLOYED AS AN IMPROVED COMPENSATING CIRCUIT FOR A CAPACITOR'S DIELECTRIC ABSORPTION LOSSES

Friedrich Beerbom, Constance, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany

Filed Sept. 30, 1969, Ser. No. 862,271
Claims priority, application Germany, Oct. 1, 1968, P 18 00 206.7
Int. Cl. G05f *1/10*
U.S. Cl. 323—66 13 Claims



A four-pole network connected as an equalizing means in an integrator composed of an amplifier and a capacitor forming a feed-back loop for the amplifier, to compensate

for the losses due to dielectric absorption in the integrating capacitor, the network being connected by two of its terminals across the capacitor to receive a signal from the capacitor and to supply the capacitor with a current whose amplitude characteristic is chosen so as to compensate for the voltage changes produced by such dielectric absorption.

3,564,397

LINEAR VARIABLE CAPACITANCE TRANSDUCER

Raymond W. Sargent, Bristol, and Siderius Van Manen, Vergennes, Vt., assignors to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Continuation-in-part of application, Ser. No. 770,277, Oct. 24, 1968. This application Apr. 24, 1969, Ser. No. 819,012

Int. Cl. G05f *3/00*

U.S. Cl. 323—93 5 Claims

A linear variable capacitance transducer having an AC capacitance signal proportional to the linear displacement of a thin-walled metal tube which slides within another metal tube to provide a variable capacitance with the air therebetween as the dielectric.

3,564,398

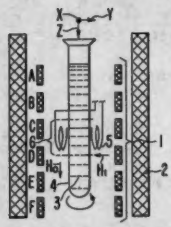
MAGNETIC FIELD HOMOGENIZING COIL SETS HAVING SPATIAL INDEPENDENCE AND SPECTROMETER MEANS USING SAME

Forrest A. Nelson, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of application Ser. No. 571,096, Aug. 8, 1966. This application July 18, 1969, Ser. No. 846,643

Int. Cl. G01n *27/78*

U.S. Cl. 324—0.5 4 Claims



Magnetic field homogenizing coil sets are provided wherein each coil set defines a geometrical configuration of current paths to be energized to produce separate asymmetric distributions of current relative to a certain region of magnetic field to be corrected. These asymmetric distributions of current produce separate homogenizing magnetic field gradient components which are substantially confined to separate portions of the region of field to be corrected for cancelling certain residual magnetic field inhomogeneities in the separate portions of the field to be corrected. In this manner, the field homogenizing gradient components are spatially independent to prevent mutual interference of their adjustment and whereby the adjustments produce unambiguous corrections of the field when sensed by gyromagnetic resonance of a sample within the region of field being corrected.

3,564,399

PROCESS AND DEVICE FOR THE DIRECT MEASUREMENT OF CHARACTERISTIC TIME CONSTANTS OF RISING OR FALLING CURVES AS A FUNCTION OF TIME, WITH PARTICULAR REFERENCE TO THE DIRECT MEASUREMENT OF NUCLEAR MAGNETIC RELAXATION TIMES

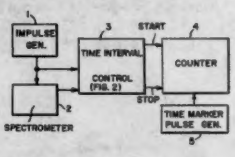
Günther Rudi Laukien, Am Silberstreifen, Forchheim, Karlsruhe, Germany

Filed May 15, 1968, Ser. No. 729,200

Claims priority, application Germany, Nov. 2, 1967, B 95,209

Int. Cl. G01n *27/78*

U.S. Cl. 324—.5 12 Claims



The time constant of a portion rising or falling of an electrical signal waveform (especially representative of relaxation phenomena in nuclear sprectrography) is determined. To ascertain the time constant, the count of a number of time marker pulses is begun at a first predetermined level of the waveform and ended at a second predetermined level. The number of time marker pulses counted is indicative of the time constant of that portion of the waveform whose signal level varied between and crossed the two predetermined levels.

3,564,400

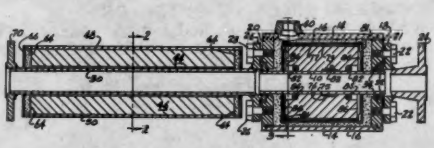
NUCLEAR MAGNETIC RESONANCE FLOWMETER EMPLOYING CERAMIC TUBE

Ronald L. Pike, Brown Deer, William H. Vander Heyden, Menomonee Falls, and John F. Toschik, Brown Deer, Wis., assignors to Badger Meter Manufacturing Company, Milwaukee, Wis., a corporation of Wisconsin

Filed Apr. 18, 1968, Ser. No. 722,365

Int. Cl. G01n *27/78*

U.S. Cl. 324—.5 7 Claims



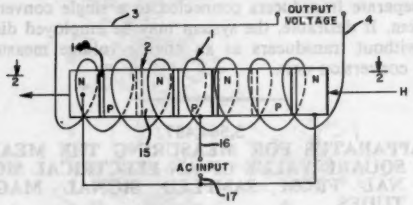
A nuclear magnetic resonance flowmeter, employing a ceramic tube as a conduit for paramagnetic fluid, is constructed using moldable ceramic material for encapsulating the coil structure of the flowmeter. The stresses encountered with high pressure, high temperature fluids can be accommodated and graphite seals prevent leakage of the fluid from within the ceramic tube. At each end of the tube a coupling is provided for connection to a conventional conduit. The coil structure is provided with apparatus for assisting in decoupling the receiver coil from the other coils located in proximity thereto, to reduce the noise content of the output signal furnished by the receiver coil.

3,564,401

THERMALLY CYCLED MAGNETOMETER

Grant W. Coon, Palo Alto, Calif., assignor to the United States of America as represented by the National Aeronautics and Space Administration

Filed Aug. 16, 1965, Ser. No. 480,211
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 10 Claims



A magnetometer for measuring static and dynamic magnetic fields. A sensing coil surrounds a magnetic core. The temperature of the core is thermally cycled above and below the Curie temperature of the core thereby causing the permeability of the core to fluctuate. A voltage proportional to the magnetic field under test is induced in the sensing coil.

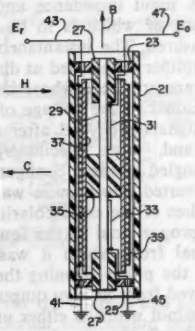
3,564,402

APPARATUS FOR MEASURING THE STRENGTH AND DIRECTION OF MAGNETIC FIELDS UTILIZING A PIEZOELECTRIC CRYSTAL

Roland Pittman, Walpole, Mass., assignor to Northrop Corporation, Palos Verdes, Calif., a corporation of California

Filed Jan. 31, 1969, Ser. No. 795,598
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 7 Claims

A multiple axis field sensor incorporating for each axis



a piezoelectric crystal acting as a spring restraining an electromagnet excited by a reference voltage against rotation in response to an external field, and circuit means controlled by the output of each crystal for producing a field strength signal.

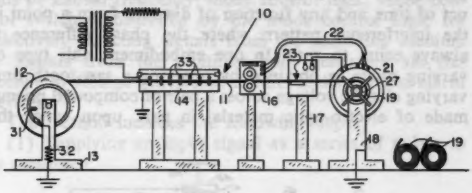
3,564,403

APPARATUS AND METHOD FOR THE SIMULTANEOUS SEVERING AND CONTINUITY TESTING OF WIRE COILS

Olek Schwarz, Plainfield, N.J., assignor to Anaconda Wire and Cable Company, a corporation of Delaware

Filed Oct. 9, 1968, Ser. No. 766,166
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 14 Claims

In a spark tester and coiler for insulated conductor, the continuity of the conductor in each coil is automatically tested by means of a circuit that makes electrical contact through the cutting blade that severs the coil. The coil



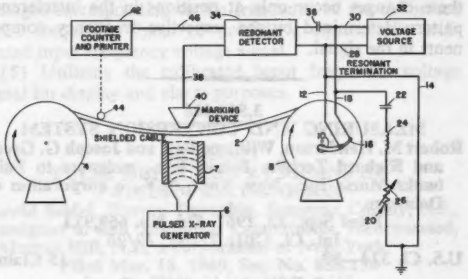
end of the conductor is grounded directly and the other end is grounded through resistance sufficiently high to appear open to the test circuit.

3,564,404

METHOD AND APPARATUS INCLUDING RESONANT TERMINATION FOR DETECTING INSULATION DIELECTRIC DISCONTINUITIES IN ELECTRIC CABLE

David Eigen, Passaic, N.J., assignor to The Okonite Company, Passaic, N.J., a corporation of Delaware

Filed Oct. 27, 1966, Ser. No. 589,891
Int. Cl. G01r *31/12*
U.S. Cl. 324—54 10 Claims



A method and apparatus for detecting discontinuities in the insulation of an electric cable wherein a stressing voltage is applied to the cable to cause ionization of dielectric discontinuities within the cable. The ionization is discharged to produce a signal having a radio-frequency component and the radio-frequency component detected by means of a resonant detector. Resonant termination means are provided for terminating the cable with respect to the radio-frequency component in the characteristic impedance of the cable thus presenting a low impedance to the radio frequency component signal and a high impedance to other signals. This provides a detected radio-frequency component substantially free of interference from reflected signals.

3,564,405

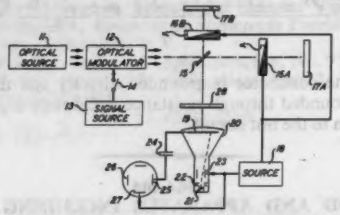
INSTANTANEOUS FOURIER FREQUENCY ANALYZER USING AN INTERFEROMETER

Herwig W. Kogelnik, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Feb. 9, 1968, Ser. No. 704,281
Int. Cl. G01r *23/16*
U.S. Cl. 324—77 12 Claims

Instantaneous Fourier analysis of the frequency components in a signal is performed by means of the analysis of the pattern of interference fringes produced by two coherent light beams, which are intensity modulated in

accordance with the signal and which are provided with a systematically varied phase difference between interfering rays in the beams. The phase difference is varied in accordance with a linear function of the algebraic product of time and any function of distance from a point in the interference pattern where the phase difference is always equal to zero. In one embodiment, this type of varying phase is obtained by applying a saw-tooth time varying electric voltage across a pair of compound prisms, made of electro-optic material in part, upon which the



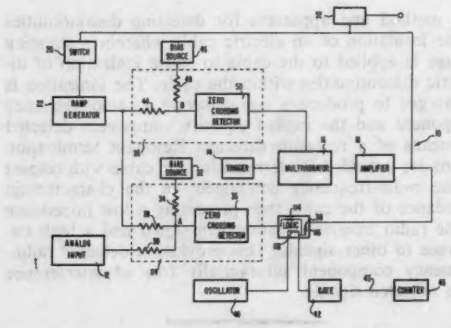
beams are incident in each arm of a Michelson interferometer arrangement, thereby deflecting the beams through an angle which is linearly proportional to the time after each saw-tooth has commenced. Observable changes in the pattern of interference fringes occur when the light intensity is thus modulated in accordance with the signal, as compared with no such modulation, and these changes occur only at positions in the interference pattern determined by the respective frequency components in the signal.

3,564,406

MEASURING AND CONVERSION SYSTEM

Robert M. Henderson, Williams Bay, and Joseph G. Green and Richard Zechlin, Beloit, Wis., assignors to Fairbanks Morse Inc., New York, N.Y., a corporation of Delaware

Filed Sept. 22, 1967, Ser. No. 669,913
Int. Cl. G01r *17/06, 19/26*
U.S. Cl. 324—99 **15 Claims**



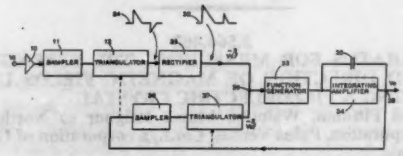
The measuring system of this invention includes a plurality of measuring stations, each of which utilizes a novel digital sensing unit. The sensing unit includes a transducer to convert an unknown factor to be measured into an electrical analog voltage and a novel conversion system which employs a voltage comparator unit capable of performing plural separate comparisons in a start pulse comparator and a stop pulse comparator. The start pulse comparator operates at a first coincidence point determined by the algebraic sum of a positive ramp signal, a negative bias signal, and the unknown analog signal to initiate a pulse counting period, while a stop pulse comparator initiates a stop pulse to end the counting period upon coincidence between a second negative bias and the ramp signal. Digital pulses created during the counting period are then sent to a counting unit. These digital pulses may result from a number of separate sensing units, from a single sensing unit, or from a sensing unit formed by a number of separate transducers connected to a single conversion system. If desirable, the system may be employed directly without transducers as an analog voltage measuring and conversion unit.

3,564,407

APPARATUS FOR MEASURING THE MEAN SQUARE VALUE OF AN ELECTRICAL SIGNAL FROM SAMPLED SIGNAL MAGNITUDES

Eric Metcalf and Anthony John Ley, Farnborough, England, assignors to The Solartron Electronic Group Ltd., Farnborough, England

Filed Jan. 17, 1967, Ser. No. 609,831
Claims priority, application Great Britain, Jan. 18, 1966, 2,377/66
Int. Cl. G01r *15/10, 17/06*
U.S. Cl. 324—120 **9 Claims**



A voltmeter for measuring the root mean square or mean square amplitude of a voltage includes an input amplifier of high input impedance and low output impedance, the input of which is to be connected to the signal being measured. The instantaneous voltage of the output of the amplifier is sampled at discrete times and a series of signals are produced whose heights and lengths are both proportional to the voltage of the signal being measured. The signals produced after sampling, are triangular pulses and, more specifically, are triangular pulses of right-angled triangle configuration. The series of signals is converted into a pulse waveform consisting of a series of pulses of the same polarity with each pulse having an area proportional to the square of the amplitude of the signal from which it was formed. An integrator receives the pulses forming the pulse waveform and a signal derived from its own output so as to provide a D.C. voltage output which is either proportional to the mean area underneath the waveform and, hence, to the mean square value of the voltage of the signal being measured, or, by sampling the integrator output signal in a manner similar to that used after the input amplifier, proportional to the root of the mean area underneath the waveform and to the root mean square of the voltage of the signal being measured.

3,564,408

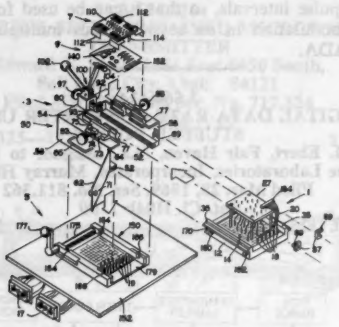
TEST DEVICE FOR AN ELECTRICAL CIRCUIT CARD

Frank G. Schulz, Rahway, and Mario Antonazzi, Oradell, N.J., assignors to The Bendix Corporation

Filed Aug. 12, 1968, Ser. No. 752,076
Int. Cl. G01r *15/12, 31/26*
U.S. Cl. 324—158 **26 Claims**

A universal printed circuit card contact test fixture to mount many sizes and types of printed circuit cards for

making simultaneous electrical contact to selected solder nodes and rivers thereon and which test fixture is adaptable for automatic fault isolation testing of the printed circuit



cards to a discrete component level and is further adaptable to different types of cards with a minimal amount of new parts fabrication and set up time.

3,564,409

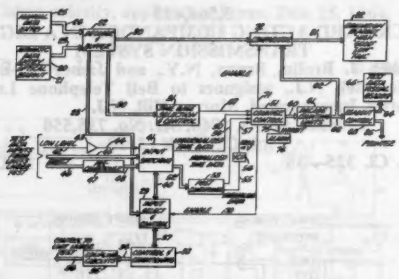
METHOD FOR MEASURING ENGINE R.P.M.

Don M. Muller and Lavar E. Whittle, Granada Hills, and Victor J. Chartrand, Chatsworth, Calif., assignors to Allen Electric and Equipment Company, Chicago, Ill.

Application Dec. 1, 1967, Ser. No. 687,390, now Patent No. 3,485,093, which is a continuation-in-part of application Ser. No. 487,861, Sept. 16, 1965. Divided and this application Jan. 21, 1969, Ser. No. 810,891

Int. Cl. G01p *3/48*

U.S. Cl. 324—169 **5 Claims**



In an apparatus for the analysis and comparison of the performance of internal combustion engines, or similar systems, an improved method is provided for measuring the r.p.m. of the engine by first obtaining a signal derived from the firing voltage of a spark plug or from the distributor and then producing a digital output signal directly proportional to engine r.p.m.

3,564,410

DYNAMICALLY CALIBRATED VELOCITY INSTRUMENTATION TECHNIQUE

George T. Webb, Austin, Tex., assignor to International Business Machine Corporation, Armonk, N.Y.

Filed Jan. 14, 1969, Ser. No. 790,929

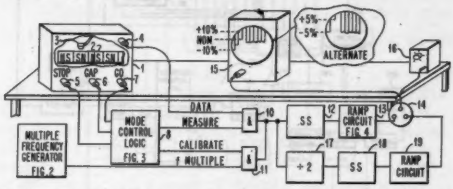
Int. Cl. G01p *3/54*

U.S. Cl. 324—172 **9 Claims**

This invention is a technique for accurately measuring the spacing of signals such as bit signals from a recording medium passing a recording head. The method includes development of a dynamically calibrated oscilloscope trace which provides instantaneous comparison of the signal frequency with a pattern of standard frequency signals. The system includes a generator of calibration signals of known frequency, mode control logic, mode control switches controlled by the mode control logic for selectively directing signals from the recording medium or signals from the multifrequency generator via frequency to voltage conversion circuits to display and alarm devices.

The method includes the following steps:

(1) Supplying an input signal as a series of pulses to be measured.



(2) Supplying a set of standard frequency signals.

(3) Multiplexing the input signal and the set of standard frequency signals according to predetermined sequence to establish a calibrated input signal sequence.

(4) Converting the calibrated input signal sequence to voltages corresponding to the frequency of the calibrated input frequency signal to provide a dynamically calibrated input frequency voltage signal.

(5) Utilizing the calibrated input frequency voltage signal for display and alarm purposes.

3,564,411

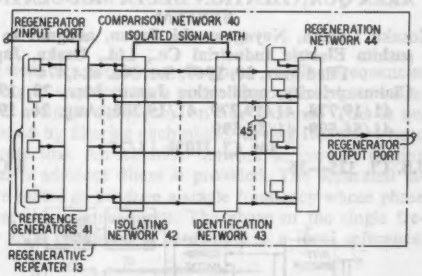
PULSE DETECTION BY MEANS OF PATTERN RECOGNITION

Harold Seidel, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Mar. 18, 1969, Ser. No. 808,134

Int. Cl. H03k *11/00;* **H04b** *7/18*

U.S. Cl. 325—13 **6 Claims**

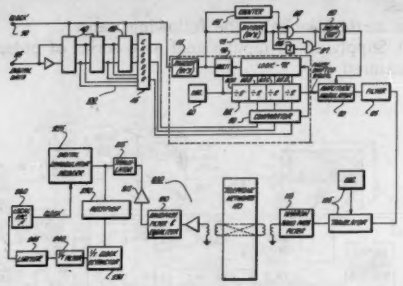


This application describes a system of pulse detection and regeneration which involves the steps of (1) comparing the received signal with a plurality of locally-generated, predistorted signals representing all possible pulse trains; (2) isolating the one comparison signal which is indicative of the "correct" locally-generated pulse train; (3) identifying the reference generator that produced the "correct" pulse train; and (4) transmitting an undistorted replica of the distorted received signal in response to said identification.

3,564,412
DERIVED CLOCK FROM CARRIER ENVELOPE

Sang Y. Whang, Miami, Paul E. Payne, Fort Lauderdale, and Robert G. Ragsdale, Hollywood, Fla., assignors to Milgo Electronic Corporation, Miami, Fla.

Filed Mar. 1, 1968, Ser. No. 709,609
Int. Cl. H04l *27/18, 7/08*
U.S. Cl. 325—30 12 Claims

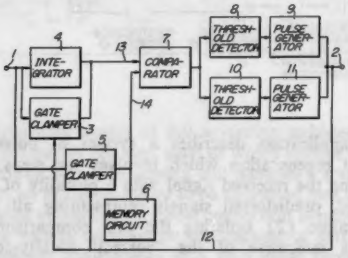


Digital data transmission at very high bit rates through randomly selected ordinary voice-grade telephone lines by the use of a transmitter which includes digital differential modulation and a receiver which includes a digital differential angle demodulation, together with a derived clock circuit at the receiver, is disclosed. The communication link includes bandpass filters which block sideband frequencies located at $1/T$ from the centerpoint, f_0, of the filter; wherein T is the modulation period, and f_0 is the carrier frequency. For random data patterns, the envelope at the receiver, due to band-limiting, is peaked at the middle of a center modulation period and drops sufficiently toward zero amplitude between modulation periods so as to contain strong $1/T$ harmonics which provide for clock derivation by slaving a local oscillator with a $1/T$ output signal. For some non-varying data patterns, the envelope does not include sufficient ripple for clock derivation. Amplitude modulation of the digital angle modulation signal at a predetermined frequency is provided at the transmitter so as to produce a signal having $1/2T$ sidebands which are passed by the filter and thus are available at the receiver for clock derivation.

3,564,413
AREA QUANTIZATION DELTA MODULATION SYSTEM

Kosaku Uchida, Neyagawa-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 20, 1967, Ser. No. 624,476
Claims priority, application Japan, Mar. 29, 1966, 41/19,778, 41/19,779, 41/19,780; Aug. 26, 1966, 41/56,598; 41/56,599
Int. Cl. H03k *13/22*
U.S. Cl. 325—38 5 Claims

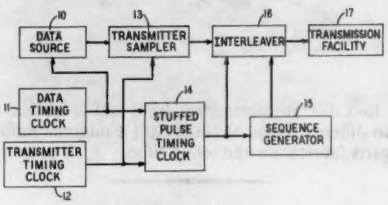


There is disclosed a modulation system based on a fundamental idea that the system produces a positive or negative output pulse when an area defined by the time axis and the increment of input signal voltage after occurrence of the preceding output pulse from the system reaches a predetermined positive or negative amount. This system is constituted to feature less number of output pulses, high immunity against interfering pulses and longer pulse intervals, so that it can be used for the primary modulation in an asynchronous multiplex system like RADA.

3,564,414
DIGITAL DATA RATE CONVERTER USING STUFFED PULSES

Paul M. Ebert, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1969, Ser. No. 811,362
Int. Cl. H04b *1/00*
U.S. Cl. 325—38 12 Claims

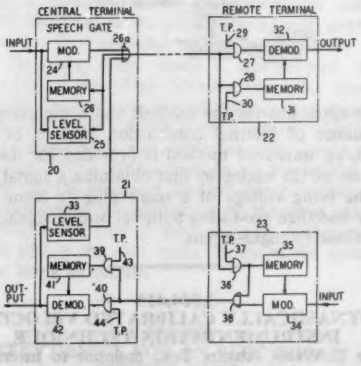


A digital data transmission system designed to operate at one rate is adapted to transmit data at another rate without altering the transmission facility, provided the data source rate is lower than the transmission rate. The arrangement is such that data bits are sampled once only. Where multiple samples would otherwise have occurred, a predetermined pulse sequence is interleaved with the data samples to maintain synchronism.

3,564,415
BACKWARD ACTING COMPANDOR IN A DIGITAL TRANSMISSION SYSTEM

Stephen J. Brolin, Bronx, N.Y., and James M. Brown, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

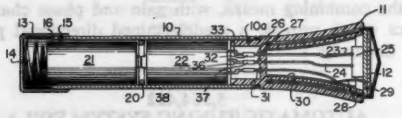
Filed Apr. 3, 1968, Ser. No. 718,550
Int. Cl. H03k *13/22*
U.S. Cl. 325—38 16 Claims



A digital transmission system is disclosed utilizing backward acting companding. A variable size step pulse source is used at the modulator to achieve compression and another is used at the demodulator to achieve complementary expansion. Means located at the demodulator responsive to a parameter of the transmitted message

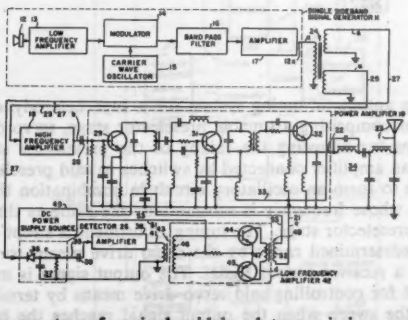
waveform are used to determine the amplitude of the variable size step pulse produced at the remotely located modulator and at the demodulator.

3,564,416
CORDLESS, SELF-CONTAINED MICROPHONE TRANSMITTER
Edward G. Price, 1471 East 6050 South, Salt Lake City, Utah 84121
Filed Mar. 29, 1968, Ser. No. 717,224
Int. Cl. H04b *7/20*
U.S. Cl. 325—111 **1 Claim**



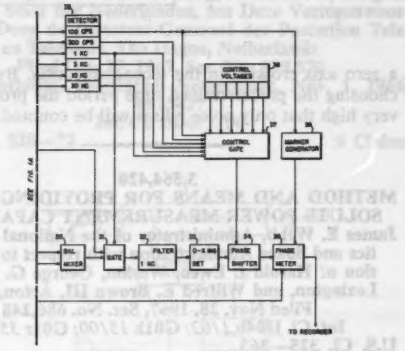
A cordless, self-contained, frequency modulated microphone transmitter including a housing adapted to be hand-held; a microphone pickup element; and a circuit comprising a battery, an input impedance matching and equalization network, a triplex Colpitts radio frequency oscillator-modulator, an antenna that includes components of the microphone pickup element; and an isolating buffer amplifier to couple frequency modulated energy to the antenna.

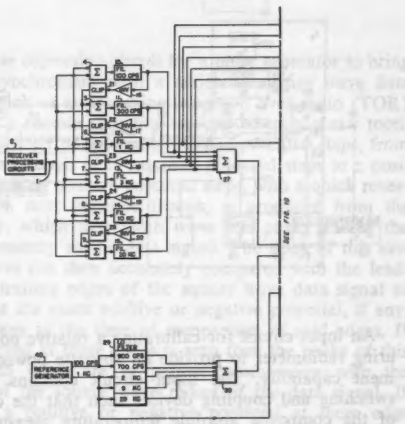
3,564,417
SINGLE SIDEBAND TRANSMISSION SYSTEM FOR PRODUCING A MAXIMUM AMPLITUDE SIGNAL
Michio Kurusu, Kawasaki-shi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Continuation-in-part of application Ser. No. 432,487, Feb. 15, 1965. This application Mar. 11, 1968, Ser. No. 716,692
Claims priority, application Japan, Feb. 15, 1964, 39/7,954
Int. Cl. H04b *1/68*
U.S. Cl. 325—137 **5 Claims**



A generator of a single sideband transmission system produces a single sideband signal substantially without a carrier. The generator supplies the single sideband signal to a linear power amplifier via a high frequency amplifier. A detector detects a portion of the envelope of the single sideband signal and produces an output signal corresponding to such envelope. The output signal of the detector is superimposed on a DC signal to provide a resultant signal having an amplitude higher by the level of the DC signal than the amplitude of the output signal. The resultant signal is applied to the power amplifier in a manner to increase the amplification of the single sideband signal for transmission in accordance with the resultant signal.

3,564,418
SINGLE CHANNEL DISPLAY OF SERIAL DATA
Hugh B. Gardner, Oxon Hill, Md., and Alick H. Frank, Springfield, Va., assignors to the United States of America as represented by the Secretary of the Navy
Filed Oct. 21, 1968, Ser. No. 769,349
Int. Cl. H04b *1/00*
U.S. Cl. 325—320 **5 Claims**



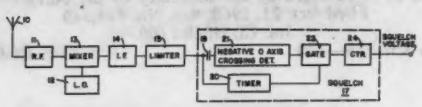


A system for displaying six phase varying frequencies appearing in sequence on a single channel as phase variations of a single frequency on one channel. This is accomplished by filtering each phase varying frequency onto a separate line. An isolation network to prevent ringing of parallel adjacent filters is provided. The separated inputs are mixed to produce a single frequency whose phase varies as the original input. The phase of the single frequency thus generated is compared to a local reference.

3,564,419
PULSE COUNTING SQUELCH CIRCUIT
Thomas M. Yackish, Hammond, Ind., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Mar. 10, 1969, Ser. No. 805,723
Int. Cl. H03g *3/24*
U.S. Cl. 325—348 **6 Claims**

The random distribution of zero axis crossings of noise as compared with the regular zero axis crossings of a desired signal is used to determine that the signal is being received. Zero axis crossings in a first direction are coupled through a gate to a counter to be counted thereby. Zero

axis crossings in the other direction are used to close the gate to prevent the counting of the zero axis crossings in the first direction for a predetermined period of time after



a zero axis crossing in the second direction. By properly choosing the predetermined time period the probability is very high that only noise pulses will be counted.

3,564,420

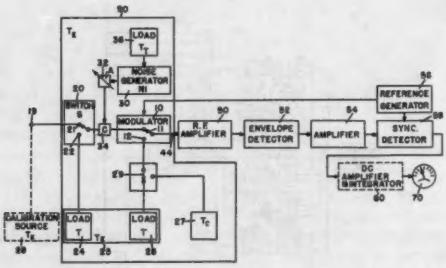
METHOD AND MEANS FOR PROVIDING AN ABSOLUTE POWER MEASUREMENT CAPABILITY

James E. Webb, Administrator of the National Aeronautics and Space Administration with respect to an invention of Harold I. Ewen, Weston, George G. Haroules, Lexington, and Wilfred E. Brown III, Acton, Mass.

Filed Nov. 28, 1967, Ser. No. 686,248

Int. Cl. H04b *1/02;* **G01k** *15/00;* **G01r** *35/00*

U.S. Cl. 325—363 **5 Claims**



An input circuit for calibrating a relative power measuring radiometer to provide an absolute power measurement capability. The input circuit contains reference, switching and coupling devices such that the calibration of the composite absolute temperature measuring radiometer is achieved without the incorporation of cryogenic cooled noise sources as a part of the equipment. The radiometer output indicator zero position corresponds to absolute zero in degrees Kelvin. The injection of noise at a pre-set level in the input signal transmission path provides calibration of the output indicator scale directly in degrees Kelvin.

3,564,421

AERIAL ARRAYS

Dennis Henry Covill, Halifax County, Nova Scotia, Canada, assignor to E.M.I. Electronics Canada Limited, Ottawa, Ontario, Canada, a company of Canada

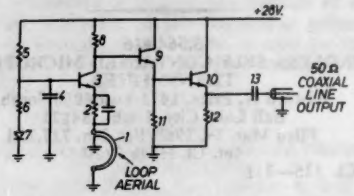
Filed Oct. 11, 1967, Ser. No. 674,478

Claims priority, application Great Britain, Dec. 21, 1966, 57,111/66; June 14, 1967, 27,352/67

Int. Cl. H04b *1/06*

U.S. Cl. 325—367 **4 Claims**

A directional array of aerials is disclosed incorporating a plurality of untuned loop aerials which are substantially inductive over the working frequency range of the array and a plurality of transistor amplifiers arranged in grounded base configurations. Each one of the loop aerials is effectively connected in series with the emitter lead of a respective one of the transistor amplifiers, and means are provided for combining signals from the collectors of the transistor amplifiers to form an output signal, the aerials being arranged, and the transistor amplifiers being coupled



to the combining means, with gain and phase characteristics which provide a predetermined directional pattern for the array.

3,564,422

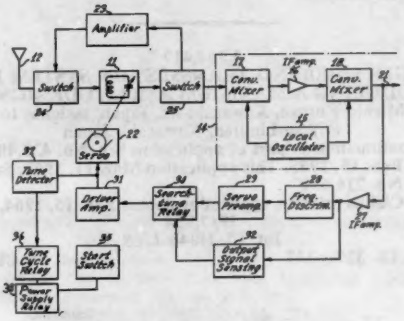
AUTOMATIC TUNING SYSTEM FOR A SUPERHETERODYNE RECEIVER

Joel Julie, Bronxville, and Edward J. Roth, Old Bethpage, N.Y., and Jonas M. Shapiro, Stamford, Conn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 5, 1968, Ser. No. 719,101

Int. Cl. H04b *1/06, 1/32*

U.S. Cl. 325—389 **7 Claims**



An automatic tuning system for a superheterodyne receiver comprising a tunable preselector stage, servo drive means for adjusting the tuning of the preselector stage, and an amplifier connected by switches to said preselector stage to form an oscillatory circuit in combination therewith whose frequency is substantially the same as that of the preselector stage. The tuning adjustment is swept over a predetermined range by the servo drive means to provide a receiver output signal. The output signal is monitored for controlling said servo drive means by terminating the sweep when the output signal reaches the tuned frequency desired.

3,564,423

MULTIBAND VARACTOR TV TUNER

Walter Pützer, Krefeld, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 10, 1968, Ser. No. 720,126

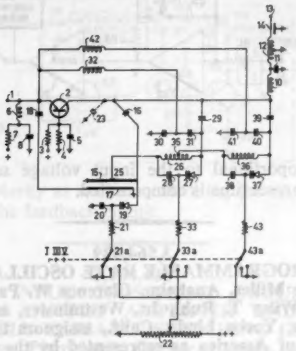
Claims priority, application Germany, Apr. 29, 1967, P 42,041

Int. Cl. H04b *1/16*

U.S. Cl. 325—458 **2 Claims**

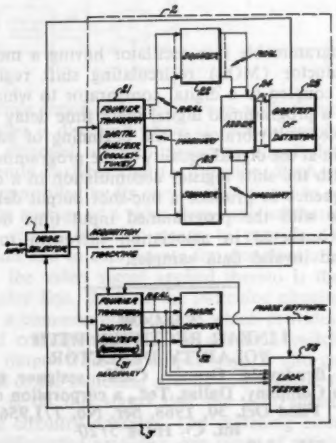
A multiple band tuning circuit having resonant circuits for each band that are connected to be tuned by separate voltage dependent reactances. The higher frequency

resonant circuits are tapped, and are connected in the circuit to form separate bridge circuits, with the taps being positioned so that each bridge is in balance at the



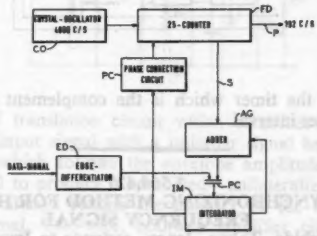
tuning frequencies of the respective band. Each lower frequency resonant circuit is connected to the tap of the next higher frequency resonant circuit.

3,564,424
DIGITAL PHASE LOCKED LOOP
Don G. Freeman, Gaithersburg, Richard Van Blerkom, Rockville, and Richard C. Crutchfield, Jr., Potomac, Md., assignors to the United States of America as represented by the Secretary of the Air Force
Filed May 15, 1968, Ser. No. 729,331
Int. Cl. H04b 1/36
U.S. Cl. 325—468 **2 Claims**



A digital phase locked loop in which in an acquisition mode an analyzer using a Cooley-Tukey algorithm resolves an input signal into real and imaginary components and the component of highest power is determined. Then in the tracking mode a second analyzer perfo. ms a Fourier transform using a recursive relationship on the input signal only in the neighborhood of the largest spectral component. The phase is determined and tested for the largest component and the mode selector is adjusted accordingly.

3,564,425
PHASE CORRECTING CIRCUIT
Wilhelm Fredrik Brok, Voorburg, Netherlands, assignor to De Staat der Nederlanden, ten Deze Vertegenwoordigd Door de Directeur-Generaal der Posterijen Telegrafie en Telefonie, The Hague, Netherlands
Filed Oct. 27, 1967, Ser. No. 678,572
Claims priority, application Netherlands, Nov. 1, 1966, 6615427
Int. Cl. H04l 7/00
U.S. Cl. 328—72 **9 Claims**

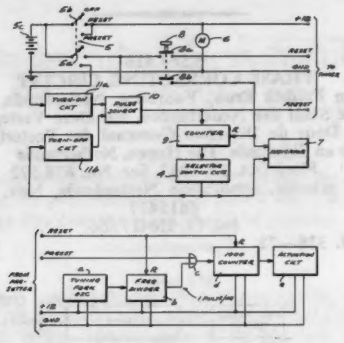


A phase correcting circuit for a pulse generator to bring it into synchronism with a series of square wave data signals, such as an incoming telegraph over radio (TOR) signal at a remote receiving station, wherein a saw tooth wave of $2N+1$ negative and positive potential steps, from a negative trough of N negative potential steps to a positive peak of N positive potential steps, with a quick reversal to the next negative trough, is produced from the generator, which saw tooth wave has peaks having the same frequency as the data signal. The steps of this saw tooth wave are then accurately compared with the leading and trailing edges of the square wave data signal to determine the exact positive or negative potential, if any, of the steps at the time of comparison of said edges. If the potential at these edges is zero then the peaks of this saw tooth wave are in perfect synchronism with the centers of the square wave pulses of the data signal. If there is a positive or negative potential at these edge times, then these potentials are added until a predetermined number n of positive or a predetermined number n of negative potential increments are reached at which time a step is subtracted or added to, respectively, the steps composing the saw tooth wave to advance or retard, respectively, the phase of its peaks with respect to the centers of the square pulses of the data signal, to move said saw tooth peaks more into synchronism with said data signal.

3,564,426
PRESETTER FOR TIMERS
Wilmer C. Anderson, Greenwich, and Richard Cruger, Stamford, Conn., assignors to General Time Corporation, Stamford, Conn.
Filed Jan. 22, 1969, Ser. No. 793,003
Int. Cl. H03k 21/32
U.S. Cl. 328—48 **12 Claims**

A preset timer system including a timer which normally counts at a real time rate and provides an actuation upon reaching a full count, and an associated presetter which supplies pulses to the timer at a compressed non-real time rate. Switches are selectively set by the operator to indicate the desired timer interval, and these

switches are so connected to electronic decimal counters that, when the timer is preset, a number of pulses is supplied to the timer which is the complement of the desired timer interval.



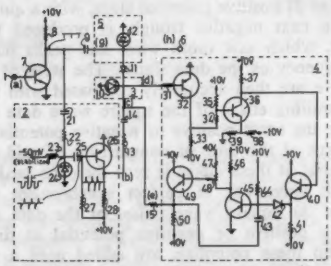
3,564,427
SYNCHRONIZING METHOD FOR HIGH FREQUENCY SIGNAL

Kozo Uchida, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 613,594, Feb. 2, 1967. This application Aug. 4, 1969, Ser. No. 847,343

Int. Cl. H03k *3/31, 25/02*

U.S. Cl. 328—63 **4 Claims**



An improved synchronizing circuit for obtaining an output pulse of low repetition rate, which is synchronized with an input of high frequency, in a jitterless and stable condition. The synchronizing circuit is switched from a waiting condition to an inoperative condition by the high frequency input signal and then switched back from the inoperative condition to the waiting condition which is generated a pulse by one pulse before a synchronizing pulse of the input signal.

3,564,428
RESET TIME COMPENSATOR FOR FREQUENCY CONVERTER

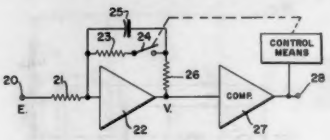
Anthony M. Demark, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware

Filed Feb. 29, 1968, Ser. No. 709,446

Int. Cl. G06g *7/18;* **H03k** *5/00*

U.S. Cl. 328—127 **3 Claims**

There is provided a voltage to frequency converter which includes an integrating amplifier having a capacitor feedback path. Impedance means are included in the feedback path to provide an offset voltage which is directly proportional to the input voltage such that the capacitor reset time is compensated.



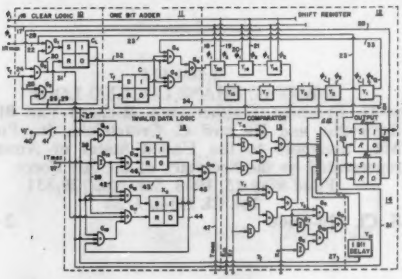
3,564,429
PROGRAMMABLE RATE OSCILLATOR

Lawrence Miller, Anaheim, Clarence W. Padgett, Buena Park, Wiley T. Ruhl, Jr., Westminster, and Walter J. Schultz, Yorba Linda, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Feb. 5, 1969, Ser. No. 796,668

Int. Cl. H03k *5/00*

U.S. Cl. 328—129 **8 Claims**



A programmable rate oscillator having a metal oxide semiconductor (MOS) recirculating shift register type counter coupled to a digital comparator to which is also coupled a programmed digital input time delay to switch a bistable multivibrator at the beginning of each count and again at the digital equality of the programmed digital input with the shift register accumulation in a data sampled sequence to produce a one-shot output delay in accordance with the programmed input time delay with means connected in association therewith to indicate valid and invalid data samples.

3,564,430
LINEAR RECTIFIER WITH POLARITY DETECTOR

Leif P. Brudevold, Orange, Calif., assignor to Collins Radio Company, Dallas, Tex., a corporation of Iowa

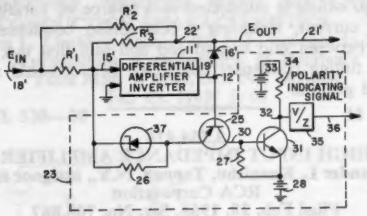
Filed Oct. 30, 1968, Ser. No. 771,956

Int. Cl. H03k *5/20*

U.S. Cl. 328—140 **4 Claims**

A linear rectifier with an input signal polarity indicator and comprising a differential amplifier with first and second feedback means extending from the output terminal thereof back to the input terminal thereof. The first feedback means is conductive only in response to a first polarity of the input signal to cause generation of a portion of the output signal, and the second feedback means is conductive only in response to the second polarity of the input signal to cause generation of the remainder of the output signal. The second feedback means comprises means which

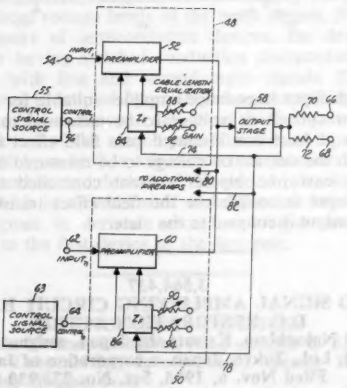
becomes conductive or nonconductive in accordance with the polarity of the input signal, thereby indicating the input signal polarity as well as controlling the state of conductivity of the feedback circuit.



3,564,431
MULTIPLE INPUT CROSSPOINT GROUP WITH COMMON OUTPUT AMPLIFIER AND INDEPENDENTLY VARIABLE SWITCHING CIRCUITS

Ole Skrydstrup, Pierrefonds, Quebec, Canada, assignor to Central Dynamics, Ltd., Montreal, Quebec, Canada

Filed Apr. 22, 1968, Ser. No. 722,870
Int. Cl. H03k 17/00
U.S. Cl. 328—154 **6 Claims**

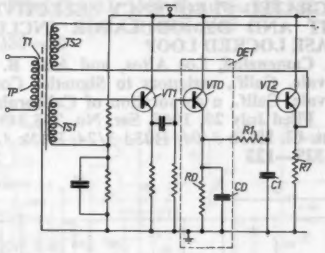


A multiple input crosspoint group with common output amplifier is disclosed where at each crosspoint of the group is disposed a video switching circuit having an independently variable transfer function. Each switching circuit is controlled by its own control signal to permit or prevent the passage of a video signal applied thereto. Each switching circuit includes means to provide delay line equalization and to compensate for attendant attenuation whenever the video signal applied thereto is the output from a delay line. Each of the switching circuits is connected to a common output stage which provides an output signal corresponding to the activated switching circuit. The output from the output stage is also connected back to all of the switching circuits as a negative feedback signal. It is on this signal that the gain adjusting and equalizing circuitry operates. The switching circuitry includes a differential amplifier, one input of which is connected to its associated video signal and the other of which is connected to the amplitude adjusted and equalized negative feedback signal. The differential amplifier includes a constant current transistor which feeds both transistors of the differential amplifier. The constant current transistor is responsive to the control signal to thereby switch the switching circuit on whenever the control signal is present. Also disclosed is circuitry for insuring that whenever one of the switching circuits is on the others are turned off.

3,564,432
VOICE FREQUENCY SIGNAL TRANSLATION CIRCUIT

Ralph Archibald Jones, Highbury, London, England, assignor to Her Majesty's Postmaster General, London, England

Filed Apr. 25, 1967, Ser. No. 633,447
Claims priority, application Great Britain, Apr. 29, 1966, 18,966/66
Int. Cl. H03d 1/04
U.S. Cl. 329—101 **7 Claims**

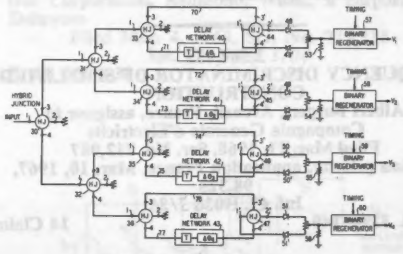


A signal translation circuit which combines a voice frequency input signal with a unipolar signal having an amplitude which follows the envelope amplitude of the input signal to produce a combined—unilateralized—signal which always retains the polarity of the envelope derived signal. Two-wire, bothway amplifier circuits, a conference telephone circuit and a loudspeaking telephone circuit using such translation circuits are described. All the circuits incorporate gates operated by unilateralized signals which have an instantaneous magnitude defined by the voice frequency signal envelope amplitude thereby directly relating the operating signal level to the input signal level.

3,564,433
MULTIPHASE DIFFERENTIAL-PHASE-MODULATED PCM REPEATER

Stewart E. Miller, 67 Wigwam Road, Locust, N.J. 07760

Original application Aug. 8, 1967. Ser. No. 659,099. Divided and this application Aug. 26, 1969, Ser. No. 870,926
Int. Cl. H04l 27/22
U.S. Cl. 329—112 **2 Claims**



This invention relates to apparatus and method for detecting a $2n$-phase differential-phase-modulated PCM signal in which the relative phase shift between signals in adjacent time slots is $\pm (2m-1)\ \pi/2n$ radians, where $2n$ is the number of possible signal phases, and m signifies all the integers between one and n inclusive.

Phase detection involves dividing the input signal into $2n$ signal components, and then comparing the phase of each n of these components with the phase of the signal in the next succeeding time slot. This is done by delaying each of said n signal components a specified length of time which depends upon the number of signal phase states. The signals produced as a result of each of these

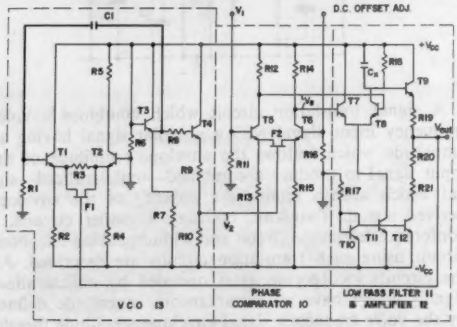
comparisons are amplitude-detected by means of a pair of oppositely-poled amplitude detectors, and then combined in a common impedance to produce n baseband signals which, when taken together, contain all the information necessary to regenerate the input signal. In particular, one of the baseband signals indicates the sign ($\pm$) of the phase shift whereas the sum of the other ($n-1$) baseband signals indicates the magnitude of the phase shift.

3,564,434

INTEGRATED FREQUENCY SELECTIVE CIRCUIT AND DEMODULATOR INCLUDING PHASE LOCKED LOOP

Hans R. Camenzind, Los Altos, and Alan B. Grebene, Sunnyvale, Calif., assignors to Signetics Corporation, Sunnyvale, Calif., a corporation of California

Filed July 29, 1968, Ser. No. 748,349
Int. Cl. H03b 3/04; H03d 3/24; H03k 3/26
U.S. Cl. 329—122 **19 Claims**



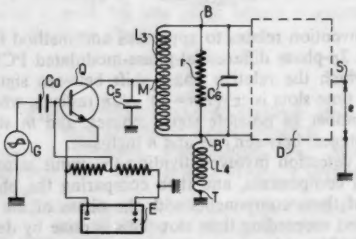
An integrated frequency selective circuit particularly used for demodulating an FM signal which includes a phase locked loop having a phase comparator coupled to a low pass filter and amplifier which in turn has an output voltage which is the desired demodulated input signal and is coupled to a voltage controlled oscillator. The frequency output of the oscillator provides the other input to the phase comparator to complete the loop. With the use of the phase locked loop, tolerance variations greater than 10% in integral circuit elements can easily be tolerated. Back to back diodes may be incorporated in the circuits to provide limiting action for improved interference rejection.

3,564,435

FREQUENCY DISCRIMINATOR OF SIMPLIFIED CONSTRUCTION

Albert Burgert, Arcueil, France, assignor to Compagnie Generale d'Electricite

Filed Mar. 11, 1968, Ser. No. 712,087
Claims priority, application France, Mar. 10, 1967, 98,323
Int. Cl. H03d 3/26
U.S. Cl. 329—140 **14 Claims**



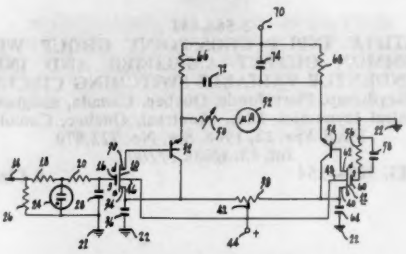
Frequency discriminator with a single coil having a first end connected to ground, a second end connected to a first terminal of a differential detection network, a first tap connected to the second terminal of said network, and a middle tap connected between said second end and said first tap, which is connected to a source of variable frequency current, including a first tuning condenser connected between said second end and said first tap, and a second tuning condenser connected between said middle tap and ground.

3,564,436

HIGH INPUT IMPEDANCE AMPLIFIER

Sander L. Knanishu, Tappan, N.Y., assignor to RCA Corporation

Filed Feb. 28, 1968, Ser. No. 708,867
Int. Cl. H03f 3/26, 3/04
U.S. Cl. 330—3 **4 Claims**



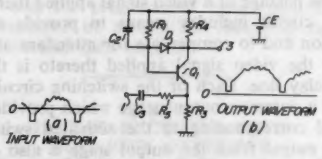
A high input impedance amplifier suitable for coupling very low current or voltage to be measured to a meter includes at least one insulated gate field effect transistor to which the current or voltage to be measured is applied and at least one bipolar current controlled transistor whose input is coupled to the field effect transistor and whose output is coupled to the meter.

3,564,437

VIDEO SIGNAL AMPLIFYING CIRCUIT HAVING D.C. RESTORATION ACTION

Takashi Nakashima, Katsuta-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan, a corporation of Japan

Filed Nov. 6, 1968, Ser. No. 773,930
Claims priority, application Japan, Nov. 8, 1967, 42/71,443
Int. Cl. H03f 21/00
U.S. Cl. 330—11 **5 Claims**



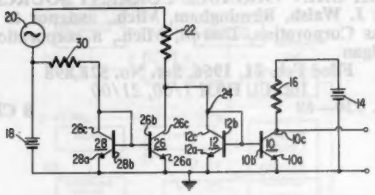
An amplifying clamp circuit comprising: an emitter grounded NPN transistor applied with a bias voltage to the base thereof through a series circuit of first and second resistors; a capacitor connected to the junction between said resistors to hold the electric potential of the junction; a diode inserted between the collector and said junction to allow a current flow therethrough when the collector potential becomes lower than that of said junction, thereby obtaining an amplifying clamp circuit operatingly deriving from the collector an output signal which is representative of an amplified input signal applied to the base and is clamped at the minimum level.

3,564,438

SIGNAL TRANSLATING CIRCUIT HAVING FIRST AND SECOND PAIRS OF SEMICONDUCTOR DEVICES WITH MATCHING CONDUCTION CHARACTERISTICS

Allen L. Limberg, Somerville, N.J., assignor to RCA Corporation, a corporation of Delaware

Filed Mar. 3, 1969, Ser. No. 803,804
Int. Cl. H03f 3/68
U.S. Cl. 330—30 11 Claims



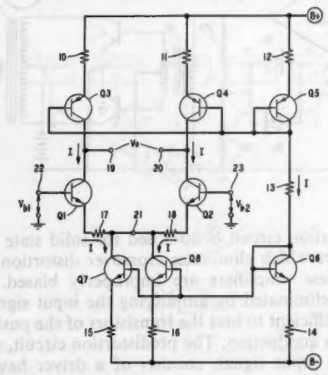
A signal translating circuit particularly well suited for fabrication as an integrated circuit which provides an output signal representative of a difference between two input signals, the output signal being referenced to a predetermined direct voltage level substantially independent of the direct voltage levels of the input signals. First and second pairs of semiconductor devices, the devices in each pair having matched conduction characteristics, are supplied with first and second input signals. The first input signal is coupled by an impedance to a junction between the first and second devices of the first pair and the second device of the second pair. The second input signal is coupled by a further impedance to a junction between the first and second devices of the second pair. An output signal which is a function of the difference between the input signals is derived across an output impedance coupled to the first device of the first pair.

3,564,439

DIFFERENTIAL AMPLIFIER

Tadikonda N. Rao, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed May 21, 1969, Ser. No. 826,424
Int. Cl. H03f 3/68
U.S. Cl. 330—30 7 Claims



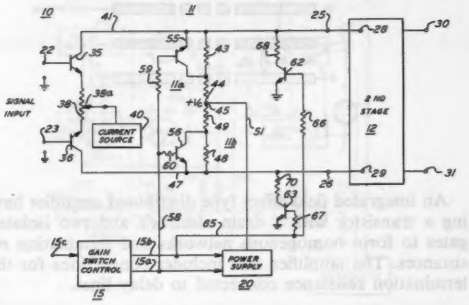
A differential amplifier utilizes matched transistor current sources in both the emitter and collector circuits of the differential pair in order to achieve high common mode rejection and differential gain without sacrificing the differential output.

3,564,440

DC COUPLED DIFFERENTIAL AMPLIFIER

Don N. Lee, Willingboro, N.J., assignor to Computer Test Corporation

Filed Oct. 31, 1969, Ser. No. 872,962
Int. Cl. H02f 3/68
U.S. Cl. 330—30 9 Claims



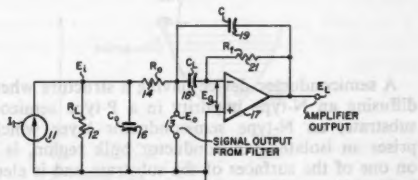
A gain controlled wideband DC coupled differential amplifier having a fast response time in which the DC potentials at the outputs of the amplifier are maintained constant and equal in value as the gain is varied. To vary the gain, portions of the differential load resistances are short circuited and simultaneously compensating resistances are coupled to the load resistances. At the same time, the supply potential is varied in a direction tending to maintain constant the DC potentials.

3,564,441

LOW-PASS ACTIVE FILTER

Melvin O. Eide, Seattle, Wash., assignor to United Control Corporation, Redmond, Wash., a corporation of Delaware

Filed Mar. 4, 1968, Ser. No. 710,218
Int. Cl. H03f 3/04
U.S. Cl. 330—31 6 Claims

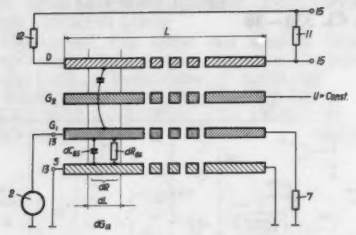


A low-pass filter employs an active filter preceded by a passive filter, the active filter being AC coupled in shunt with the passive filter. The passive filter carries most of the current, thus reducing the current supplied to the active filter and permitting the components of the active filter to be of smaller size.

3,564,442
INTEGRATED FIELD-EFFECT DISTRIBUTED AMPLIFIER

Reimar Germann, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Feb. 13, 1969, Ser. No. 798,878
Claims priority, application Austria, July 30, 1968, A 7,441/68
Int. Cl. H03f 3/16
U.S. Cl. 330—35 1 Claim

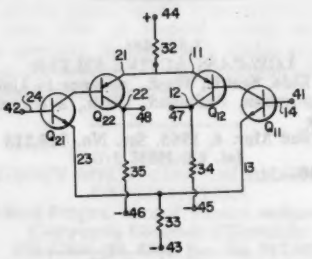


An integrated field-effect type distributed amplifier having a transistor with a drain electrode and two isolated gates to form homogenous networks and termination resistances. The amplifier also includes connections for the termination resistance connected to delay lines.

3,564,443
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE CONTAINING LATERAL AND PLANAR TRANSISTOR IN A SEMICONDUCTOR LAYER

Minoru Nagata, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo-to, Japan

Filed June 29, 1967, Ser. No. 649,948
Claims priority, application Japan, June 29, 1966, 41/41,819
Int. Cl. H03f 3/14; H03k 3/26
U.S. Cl. 330—38 13 Claims

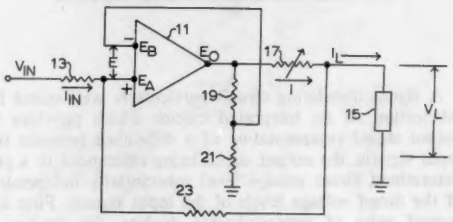


A semiconductor device having a structure wherein, by diffusing an N-type impurity in a P-type semiconductor substrate, an N-type semiconductor layer which comprises an isolated semiconductor bulk region, is formed on one of the surfaces of the substrate and is electrically isolated from said substrate. By diffusing a P-type impurity at three positions in said N-type semiconductive layer, first, second and third P-type regions that are laterally interlaid are formed. By diffusing an N-type impurity into the surface of the third P-type region, a fourth N-type region is formed. As a result of this arrangement, a PNP-type lateral transistor in which said first P-type region, said second P-type region and said N-type semiconductive layer serve as an emitter, a collector and a base, respectively; and a NPN-type double diffused planar transistor in which said third P-type region, said fourth N-type region and said N-type semiconductive layer serve as a base, an emitter and a collector, respectively, are obtained in the bulk region provided by the semiconductive layer and, furthermore, the base of the lateral transistor is electrically connected internally to the collector of the planar transistor through the bulk region provided by the semiconductive layer.

3,564,444
HIGH GAIN VARIABLE CURRENT SOURCE

William J. Walsh, Birmingham, Mich., assignor to Burroughs Corporation, Detroit, Mich., a corporation of Michigan

Filed Feb. 21, 1966, Ser. No. 528,898
Int. Cl. H03f 1/00, 21/00
U.S. Cl. 330—69 8 Claims

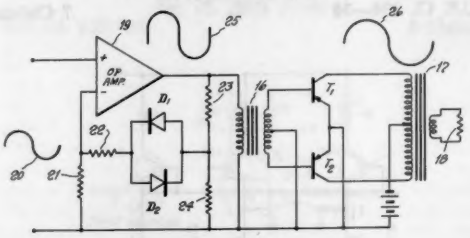


This invention relates generally to circuits for supplying a controllable current to a load, and, more particularly, to high gain differential amplifier circuits which supply a controllable current to a load, the magnitude of the current being independent of the value of load impedance.

3,564,445
CIRCUIT FOR ELIMINATING CROSSOVER DISTORTION IN SOLID STATE AMPLIFIERS

Adrian Paul Brokaw, Woburn, Mass., assignor to the United States of America as represented by the Secretary of the Navy

Filed Oct. 9, 1968, Ser. No. 766,095
Int. Cl. H03f 1/26, 1/34
U.S. Cl. 330—110 4 Claims



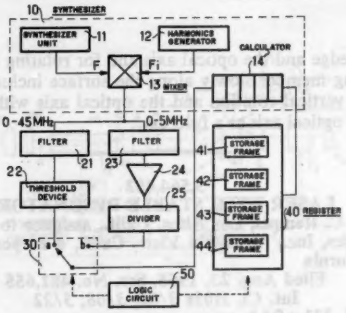
A predistortion circuit is disclosed for solid state push-pull amplifiers which eliminates crossover distortion present when these amplifiers are improperly biased. This distortion is eliminated by amplifying the input signal by an amount sufficient to bias the transistors of the push-pull amplifier into conduction. The predistortion circuit, which amplifies the input signal, consists of a driver having a pair of parallel back-to-back diodes in its noninverting feedback loop. The current-voltage characteristics of these diodes control the transfer characteristic of the driver and give it a transfer characteristic which complements that of the push-pull amplifier.

3,564,446

FREQUENCY CONTROL IN A FREQUENCY SYNTHESIZER OF VERY HIGH FREQUENCY

Lucien Babany, Blanc-Mesnil, France, assignor to C.I.T.-Compagnie Industrielle des Telecommunications, Paris, France

Filed Dec. 6, 1968, Ser. No. 781,880
Int. Cl. H03b 21/00
U.S. Cl. 331—40 10 Claims



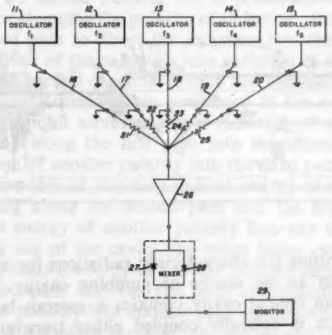
Frequency control device wherein the modulation products resulting from modulation between a synthesized frequency and a spectrum of regularly spaced reference frequencies are applied to a first filter passing first order modulation products in a band up to 20% less than one-half the frequency separation between reference frequencies and a second filter passing second order modulation products in a band up to at least 80% less than one-half the frequency separation between reference frequencies, the resulting outputs of the filters being comparable to the desired output of the synthesizer to determine the accuracy thereof.

3,564,447

APPARATUS FOR SIMULATING INTERMODULATION DISTORTION CREATED BETWEEN A PLURALITY OF RADIO FREQUENCY SIGNALS BY ENVIRONMENTAL NONLINEARITIES

Walter M. Chase, San Diego, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Oct. 24, 1966, Ser. No. 589,139
Int. Cl H03b 21/00
U.S. Cl. 331—42 4 Claims



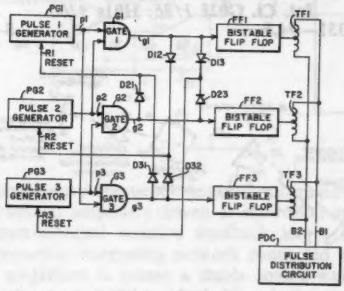
A plurality of radio frequency sources provide different discrete radio frequency signals that are mixed in a nonlinear mixing device that is selected to simulate the effect of naturally occurring nonlinear junctions in a communications system. The resulting intermodulation interference is supplied to a frequency monitoring device wherein the interference may be observed whereby interference-free receiving frequencies can be selected in accordance with the results of the simulation.

3,564,448

REDUNDANT OSCILLATOR SYSTEM

Kenneth M. Watkins, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 13, 1968, Ser. No. 775,383
Int. Cl. H03k 3/00
U.S. Cl. 331—49 8 Claims



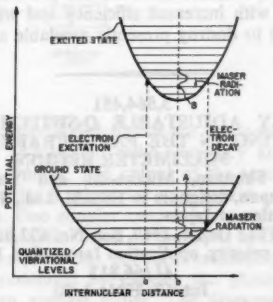
A redundant oscillator system wherein a plurality of pulse generators each generate first pulses in response to reset inputs. Each of the pulse generators supplies first pulses to an associated one of a plurality of gate circuits each of which also receives first pulses from a nonassociated one of the generators and supplies second pulses in response thereto. A reset circuit is provided to translate the second pulses from each of the gating circuits to the nonassociated ones of the plurality of pulse generators with output pulses of a predetermined frequency being provided from the system in response to the second pulses.

3,564,449

OPTICAL MASER

Marcel W. Muller, Palo Alto, and Arden Sher, Sunnyvale, Calif., assignors to Varian Associates, Palo Alto, Calif.

Continuation of application Ser. No. 218,578, Aug. 22, 1962. This application Aug. 21, 1967, Ser. No. 662,186
Int. Cl. H01s 3/16, 3/22, 3/14
U.S. Cl. 331—94.5 18 Claims



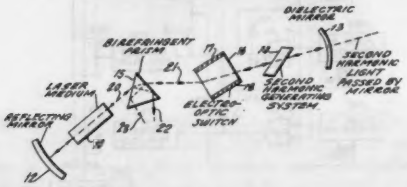
A method and apparatus is disclosed for effecting electronic transitions of the orbital electrons of the molecules of an active laser medium between two electronic states

of the bound molecules in which the equilibrium geometrical configuration of atomic nuclei is different thereby creating population inversions between nuclear vibrational levels of said molecules sufficient to establish stimulated emission of radiation due to transitions between the nuclear vibrational levels.

3,564,450
ELECTRO-OPTIC Q-SWITCH USING BREWSTER ANGLE CUT POCKELS CELL

Anthony Immarco, Elmhurst, Mark A. Steinhacker, New York, Richard J. Proebstl, Ridgewood, and Harold M. Stahl, Flushing, N.Y., assignors to Kollsman Instrument Corporation, Syosset, N.Y., a corporation of New York

Filed Oct. 11, 1967, Ser. No. 674,577
Int. Cl. G02f *1/26;* H01s *3/00*
U.S. Cl. 331—94.5 **5 Claims**



An electro-optic switch for high intensity light and useful as a superior Q-switch for the production of giant laser pulses. The switch includes a birefringent polarizing prism which totally internally reflects one component of unpolarized light and passes the other component toward a Brewster-angle cut Pockels cell. The Brewster-angle cut cell, when charged, circularly polarizes linear light passed by the polarizing prism, and subsequently linearly polarizes the circularly polarized light on its return pass through the cell with the returned light being totally reflected by the prism. When uncharged, the Pockels cell preserves the original polarization of light from the prism with this light passing back through the prism. No anti-reflection coatings are used in the system. A second prism can be added to operate the switch in a half-wave mode.

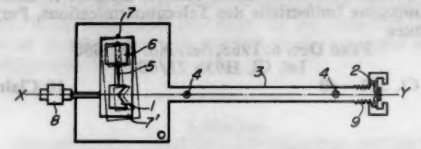
This invention relates to an electro-optic light switching device, and more particularly relates to a novel device for switching light of extremely high intensity which uses a birefringent polarizing prism which passes a linearly polarized light component from a source toward a Pockels cell with incident light on all interfaces being at or near the Brewster angle to eliminate the need for anti-reflection coatings and transparent electrodes and to minimize surface reflection losses. The switch has particular application to a Q-switched laser for the production of giant laser pulses with increased efficiency and with intensities high enough to destroy presently available anti-reflection coatings.

3,564,451
PIVOTALLY ADJUSTABLE Q-SWITCHED LASER OPERATING IN THE FAR-INFRARED OR SUB-MILLIMETER REGION

Mitsuyoshi Shimazu, Mitaka-shi, and Yasuzi Suzaki, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan, a corporation of Japan

Filed Oct. 4, 1967, Ser. No. 672,861
Claims priority, application Japan, Oct. 11, 1966, 41/66,813
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **5 Claims**

A laser device performing a Q-switch operation, wherein at least one of a pair of end parallel reflecting members composing a laser resonator is an orthogonal dihedral member. In this device, the right-angled edge of said reflecting member is placed vertically to the optical axis of the resonator and means are provided for rotating said member about an axis vertical to said right-

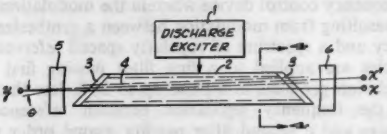


angled edge and the optical axis and for rotating the same reflecting member slowly along the surface including said axis of vertical rotation and the optical axis with a point off said optical axis as a fulcrum.

3,564,452
LASER WITH STABLE RESONATOR

Robert C. Rempel, Los Altos, Calif., assignor to Spectra-Physics, Inc., Mountain View, Calif., a corporation of California

Filed Aug. 23, 1965, Ser. No. 481,655
Int. Cl. H01s *3/02, 3/08, 3/22*
U.S. Cl. 331—94.5 **6 Claims**

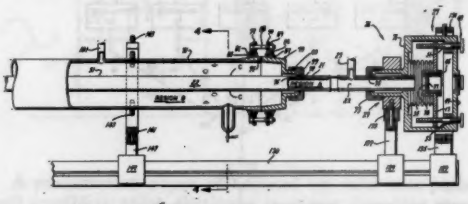


A gas laser in which the resonator reflectors are supported by an essentially non-adjustable structure in a position which establishes a fixed axis for the propagation of radiation in the resonator. Means are provided for independently adjusting the position of two length-wise spaced-apart portions of the plasma tube so that the axis of the plasma tube can be aligned with the resonator axis to within a distance which is less than the mode diameter of the resonator radiation.

3,564,453
LASER AND METHOD

Irwin Wieder, Los Altos, Calif., assignor to Carver Corporation, Mountain View, Calif., a corporation of Delaware

Filed May 19, 1967, Ser. No. 639,819
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **9 Claims**



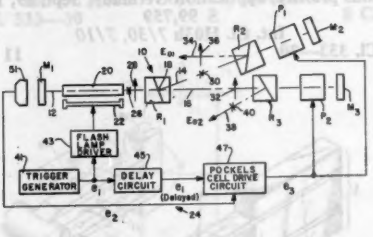
A laser using the characteristic radiations for a chemical reaction as the source of pumping energy. A tube including an optical cavity contains a gaseous laser medium which is optically coupled either transversely or endwise to a region in which gaseous matter is chemically reacting as by burning or exploding. Examples are given of a carbon dioxide laser medium pumped by a chemical reaction forming carbon dioxide from carbon monoxide or hydrocarbon gas and oxygen.

3,564,454

LASER APPARATUS WITH LASER ROD BIREFRINGENCE INSENSITIVE POLARIZED CAVITY

William R. Hook, Los Angeles, Roland H. Dishington, Pacific Palisades, and Ronald P. Hilberg, Redondo Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 28, 1967, Ser. No. 686,214
Int. Cl. H01s 3/16
U.S. Cl. 331—94.5 10 Claims



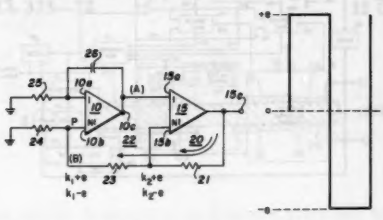
Laser apparatus in which a plurality of mirrors are positioned to define a resonant laser cavity, the laser cavity having first, second, and third radiant energy paths arranged to intersect at a common point to form a generally Y-shaped configuration, the mirrors each being positioned at the end of one of the paths. A source of laser radiation is positioned in the cavity to radiate laser energy along the first path. A Rochon prism is provided within the cavity at the common point for directing radiation of one polarity radiating along the first path from the source of radiation into the second path and radiation of another polarity into the third path, the prism being capable of directing the radiant energy of one polarity returning along the second path into the first path and the radiant energy of the other polarity returning along the third path into the first path. A second Rochon prism is positioned in the second path, the second path Rochon prism being capable of passing radiant energy of one polarity returning along the second path and directing radiant energy of another polarity into a path leading out of the cavity. A third Rochon prism is positioned in the third path, the third path prism being capable of passing radiant energy of the other polarity returning along the third path and directing radiant energy into another path leading out of the cavity. A first Pockels cell is positioned in the second path for changing the polarity of radiation returning along the second path to direct the radiation into the one path leading out of the cavity. A second Pockels cell is positioned in the third path for changing the polarity of radiation returning along the third path to direct the radiation into the other path leading out of the cavity. In one variation of the laser the first and second Rochon prisms are eliminated and the remaining Rochon prism positioned in the cavity at the common point serves to direct radiation of one polarity radiating along the first path into the second path and radiation of another polarity into the third path, the prism being capable of directing radiant energy of one polarity returning along the second path into the first path and radiant energy of another polarity into one of the paths leading out of the cavity, the prism being capable of directing radiant energy of another polarity returning along the third path into the first path and radiant energy of another polarity into another path leading out of the cavity. In still another variation, the second and third Rochon prisms along with the Pockels cell of the third path are eliminated and a quarter-wave is provided in the first path. In this variation a single output is obtained along one of the paths leading out of the cavity.

3,564,455

STABLE SQUARE-WAVE FREQUENCY GENERATOR USING TWO OPERATIONAL AMPLIFIERS WITH FEEDBACK

John O. Wedel, Baltimore, Md., assignor, by mesne assignments, to the United States of America as represented by the Secretary of the Navy

Filed July 24, 1969, Ser. No. 844,543
Int. Cl. H03b 5/20
U.S. Cl. 331—135 4 Claims



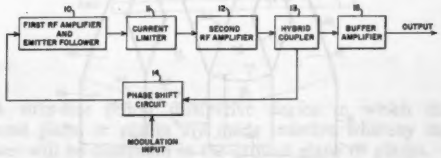
A square-wave frequency generator, formed of a pair of operational amplifiers driven at saturation and having two interconnected resistive feedback loops, has a resistor-capacitor integrating network connected across one of the amplifiers to create a stable square-wave output. Stability is ensured by employing the passive resistive elements, along with the capacitor, to establish the time period of a generated wave and, by driving the amplifiers at saturation, a self-sustaining output signal is provided whose period is relatively independent of possible minor variations in the internal supply potentials and ambient temperatures.

3,564,456

CIRCUIT FOR PRODUCING FREQUENCY-MODULATED SIGNALS

John H. Denny, Jr., Lynchburg, Va., assignor to General Electric Company

Filed Sept. 17, 1969, Ser. No. 858,773
Int. Cl. H03c 3/08; H03b 5/20; H04l 27/20
U.S. Cl. 332—16 6 Claims



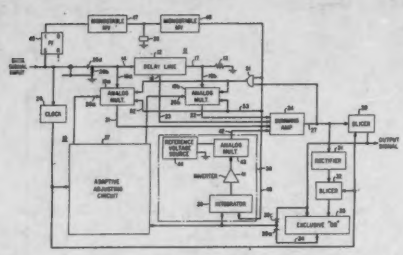
Frequency-modulated signals are produced by a circuit having first and second radio-frequency amplifiers connected by a limiter. The output of the second radio-frequency amplifier is connected to a hybrid coupler having two outputs. One coupler output is connected through a variable phase-shift circuit to the input of the first radio-frequency amplifier to produce oscillations which are frequency-modulated by varying the phase shift in response to an applied signal. The frequency-modulated oscillations have a relatively wide deviation and a relatively high deviation rate. The oscillations are derived from the other output of the directional coupler for utilization in any desired manner.

3,564,457

START UP CIRCUIT FOR ADAPTIVE EQUALIZER

Cecil W. Farrow, Monmouth Hills, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed July 18, 1968, Ser. No. 745,928
Int. Cl. H04b 3/04
U.S. Cl. 333—18 7 Claims



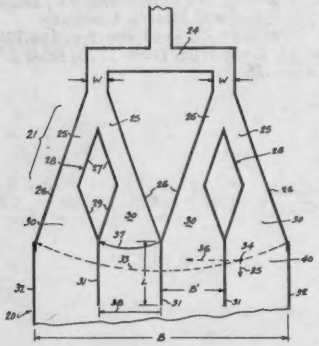
An adaptive transversal filter equalizer is described in which voltage controlled analog multipliers are employed as tap attenuators in conjunction with a D.C. offset adjusting loop. A special start-up circuit controls a start-up sequence so that the multiplication factors of the tap attenuators can be set to zero and the D.C. offset can be set to zero in a noninteracting manner.

3,564,458

BRANCHED WAVEGUIDE TRANSITIONS WITH MODE FILTERS

William A. Cumming, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada, a corporation of Canada

Filed Oct. 28, 1969, Ser. No. 871,848
Int. Cl. H01p 1/16; H05b 9/06
U.S. Cl. 333—21 1 Claim



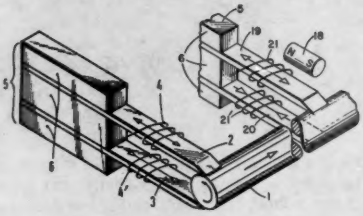
An input waveguide for feeding microwave energy in the TE_{01} mode substantially uncontaminated by higher order modes into a rectangular waveguide that is used for heating relatively wide webs and thus requires a width in which the higher order modes could propagate, is composed of a plurality of divergent waveguide sections each diverging to a width too small to propagate the higher modes but each nevertheless containing incipient such modes by reason of the effect of the divergence, such divergent sections being followed by parallel-sided filter sections for damping out the incipient higher modes before the plurality of energy paths thus formed are recombined to form a single TE_{01} mode in the wide waveguide.

3,564,459

ATTENUATION SUPPORT DEVICE HAVING A SUBSTANTIALLY STEPLESS, EXPONENTIALLY VARYING TOTAL DAMPING RATE ALONG THE LONGITUDINAL LENGTH THEREOF

Helmuth Hahn, Munich, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany, a corporation of Germany

Filed Sept. 23, 1966, Ser. No. 581,473
Claims priority, application Germany, Sept. 29, 1965, S 99,759
Int. Cl. H03h 7/30, 7/10
U.S. Cl. 333—30 11 Claims



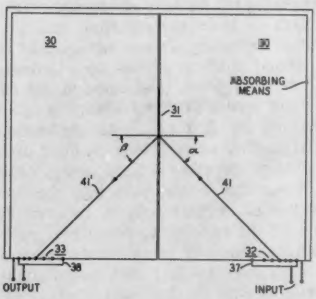
This invention relates to an attenuation support device, for use with delay lines. In particular, this invention may be used to attenuate undesirable mechanical vibrations which may be transmitted to magnetostrictive elements comprising an electrical-mechanical transducer, or a mechanical-electrical transducer and prevent reflection of said vibrations back to the delay line. The attenuation or damping of these undesirable mechanical vibrations is achieved using minimum length attenuation strips associated with the attenuation support device.

3,564,460

FOLDED PATH PERPENDICULAR DIFFRACTION DELAY LINE

Erhard K. Sittig, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Dec. 18, 1967, Ser. No. 691,453
Int. Cl. H03h 9/30
U.S. Cl. 333—30 7 Claims



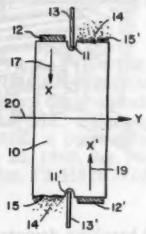
An intermediary graded grating, which may be transmitting, is positioned in the beam path between the input and output graded gratings usually found in a perpendicu-

lar diffraction delay line. The intermediary grating intercepts the beams and rediffracts desired orders of them to the output grating without loss of the inherent averaging properties of the perpendicular diffraction delay line.

3,564,461
PROCESS FOR MAKING AN ULTRASONIC DELAY CELL

James L. Jernigan, Inyokern, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Nov. 4, 1968, Ser. No. 772,989
Int. Cl. H03h 7/30, 9/00; H04b 9/00
U.S. Cl. 333—30 8 Claims

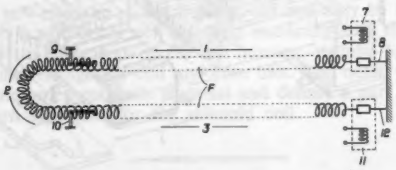


A process for making an ultrasonic delay cell wherein a quartz rod is notched at each end halfway along its optical path. First and second ultrasonic transducers are mounted at opposite ends of the rod so that one acoustic beam is behind the other in the optical path. Protective shields are inserted into the notches to prevent damage to the transducers as the portion of the end of the rod opposite each transducer is sandblasted to terminate each acoustic beam.

3,564,462
HELICAL SPRING FOR ARTIFICIAL REVERBERATION DEVICES

Werner Fidi, Baden, near Vienna, and Otto Marschall, Vienna, Austria, assignors to Akustische u. Kino-Gerate Gesellschaft m.b.H., Vienna, Austria

Filed Nov. 25, 1968, Ser. No. 778,692
Claims priority, application Austria, Nov. 29, 1967, A 10,791/67
Int. Cl. H03h 7/30
U.S. Cl. 333—30 9 Claims

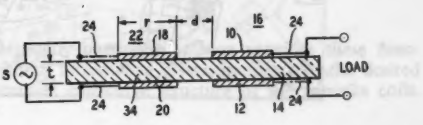


A helical spring for artificial reverberation devices is constructed to perform torsional vibration. Mounting means are connected to and support the spring under initial axial tension in a manner such that the spring has at least one straight or rectilinear portion and at least one curved portion. The straight portion is extended under stress in the direction of the axial tension. The turns of the curved portion are spaced apart sufficiently to be clear of each other.

3,564,463
MONOLITHIC PIEZOELECTRIC FILTER HAVING MASS LOADED ELECTRODES FOR RESONATION REGIONS ACOUSTICALLY COUPLED TOGETHER

William D. Beaver, Center Valley, and Roger A. Sykes, Bethlehem, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Continuation-in-part of application Ser. No. 541,549, Apr. 11, 1966. This application June 17, 1966, Ser. No. 558,338
Int. Cl. H03h 9/00
U.S. Cl. 333—72 11 Claims

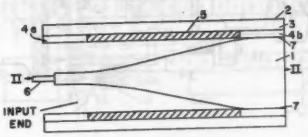


Energy is transmitted over a desired band by applying it to a pair of electrodes mounted on a crystal body and removing it from another pair of electrodes mounted on the crystal body. The electrodes have sufficient masses to concentrate thickness shear vibrations in the areas between the electrodes. The electrodes are spaced sufficiently far from the edges of the body so as to substantially eliminate the effects of the edges. The pairs of electrodes are spaced so as to couple the resonators formed by the electrodes and the body, but to limit the coupling below a given value.

3,564,464
STRIP-LINE POWER DISSIPATIVE DEVICE

Kenneth Edney Hancock, Roxboro, Quebec, and James I. Bullen, Mount Royal, Quebec, Canada, assignors to Canadian Marconi Company, Montreal, Quebec, Canada

Filed Aug. 21, 1967, Ser. No. 662,145
Int. Cl. H01p 1/22, 1/26
U.S. Cl. 333—84 5 Claims



A strip-line power dissipative device in which the ground plane or planes are made resistive whereby the power will be dissipated in the ground plane or planes.

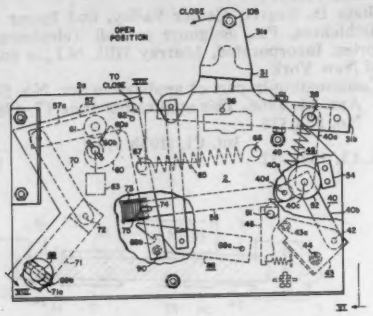
3,564,465
CIRCUIT-INTERRUPTER CONSTRUCTION AND OPERATING-MECHANISM THEREFOR WITH PARTICULAR APPLICATION TO SINGLE-PHASE RECLOSERS

Ian J. Harvey, Bloomington, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Oct. 25, 1968, Ser. No. 770,490
Int. Cl. H01h 3/02
U.S. Cl. 335—73 10 Claims

A circuit interrupter is provided, of the in-line type, having a central grounded housing and oppositely-extending hollow bushing structures, through which extends an elongated conducting operating rod actuating

the movable contact of a vacuum-type circuit-interrupter unit disposed in one of the hollow bushing structures. A simplified quick-closing and quick-opening stored-energy-



type of operating mechanism is provided, which may be motor-operated or manually-operated depending upon operating conditions.

3,564,466

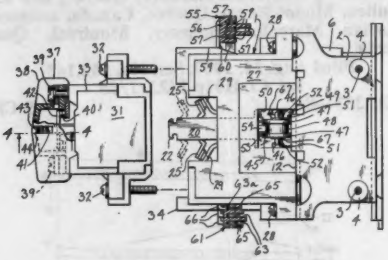
REVERSING SWITCH ASSEMBLY

Leland E. Lawrence, 6603 Revere Ave., Wauwatosa, Wis. 53213; Donald V. Zunft, 7231 Dorchester Lane, Green Dale, Wis. 53129; and John L. Haydu, 108 Enchanted Hills, Apt. T–3, Owings Mills, Md. 21117

Original application Jan. 29, 1969, Ser. No. 794,895. Divided and this application Feb. 6, 1970, Ser. No. 9,137

Int. Cl. H01h *50/16*

U.S. Cl. 335—132 **1 Claim**



A reversing switch assembly includes side-by-side switches interlocked by a roller that is engageable by the actuator of either switch to be moved to a blocking position with respect to the other. The terminals of the switches are interconnected by bus bar assemblies comprising preformed terminal connectors received in insulating holders.

3,564,467

MULTIPURPOSE DIRECT CURRENT RELAY

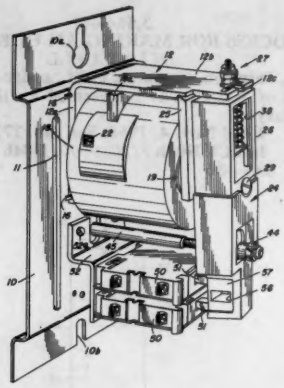
David L. Swindler, Northfield, Dennis J. Oblak, Seven Hills, and Charles Allan Schurr, Shaker Heights, Ohio, assignors to Square D Company, Park Ridge, Ill., a corporation of Michigan

Filed Feb. 25, 1969, Ser. No. 802,004

Int. Cl. H01h *50/16*

U.S. Cl. 335—132 **16 Claims**

The relay has a contact-operating arm assembly including an aramture and an adjustable retaining means which retains the armature in pivotal relationship with a magnetizable frame. The retaining means permits the contact arm assembly to be removed from the frame for full access to an operating coil or coils without the use of a tool. Provision is made for ready interchange of different



contact making and breaking devices and different operating coils so that the relay can be used for a wide variety of circuit controlling functions.

3,564,468

APPARATUS FOR CONTROLLING ELECTRIC CIRCUITS BY THE EFFECT OF A PLURALITY OF MEMBERS INFLUENCED BY A MAGNETIC FIELD AND ARRANGED IN PARALLEL

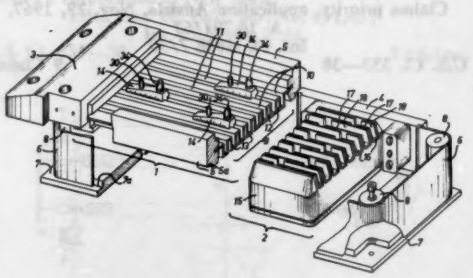
Gerard Sablayrolles, Villepreux, Jean-Claude Taulaigo, Marly-le-Roi, and Jean Lescarboura, Nanterre, France, assignors to La Telemecanique Electrique, Nanterre, Hauts-de-Seine, France, a joint-stock company of France

Filed June 17, 1969, Ser. No. 834,073

Claims priority, application France, June 20, 1968, 155,844

Int. Cl. H01h *9/00*

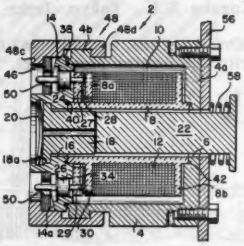
U.S. Cl. 335—207 **8 Claims**



Apparatus for controlling electric circuits by the effect of a plurality of members influenced by a magnetic field and arranged in parallel, comprising two portions of which one has a relative movement with respect to the other; one portion carrying members associated with a magnetic field is formed by a plate capable of supporting a plurality of the said members in parallel lines, the said plate being constituted by a channelled member with a crenellated section so that it is provided on one side with

a series of first parallel grooves receiving the said members and on the other side with a series of other grooves inverted; a portion carrying elements influenced by the variation of the magnetic field is constituted by a unit capable of supporting a plurality of these elements in parallel lines, each element having two magnetizable pole-cheeks which project so as to embrace the members associated with the field, carried by the other portion, a plurality of magnetizable gutters with flanges being moved parallel to each other in the inverted grooves of the said plate, each gutter having a gap solely at the position of the sensitive element with which it is associated, while the two gutters located immediately on each side have their gaps located at different points.

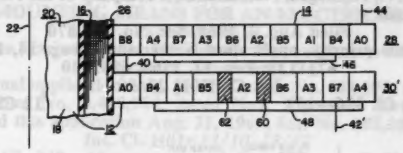
3,564,469
SOLENOID APPARATUS FOR ULTRA-HIGH VACUUM ENVIRONMENTS
Thomas A. Anastasio, Glen Burnie, and Richard G. Pokorski, Highland, Md., assignors to Dividean Incorporated, Severn, Md., a corporation of Maryland
Filed July 22, 1969, Ser. No. 843,403
Int. Cl. H01f *7/08*
U.S. Cl. 335—260 **17 Claims**



Electric solenoid apparatus designed for use in an ultra-high vacuum environment, characterized in that the solenoid coil is contained in a tightly sealed annular chamber, electrical power being supplied to the coil via terminals extending through an end wall of the chamber to actuate a solenoid plunger external of the chamber. In accordance with an important feature of the invention, the coil housing consists of a plurality of separable sections between which seal elements are arranged, spring means external of the sealed chamber being provided to bias the housing sections together to tightly compress the seal elements. Consequently, the coil may be wound upon a cylindrical non-magnetic insulating core that defines the inner wall of the coil housing, thereby forming an interchangeable coil and core unit. The outer wall is formed of a magnetic material and defines a part of the return flux path for the solenoid coil.

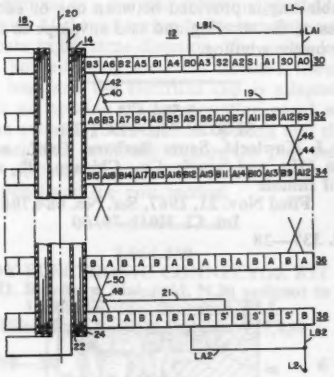
3,564,470
ELECTRICAL WINDING STRUCTURES
Robert I. Van Nice, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania
Filed Apr. 16, 1969, Ser. No. 816,539
Int. Cl. H01f *15/14, 27/08*
U.S. Cl. 336—60 **10 Claims**

An electrical winding having a plurality of pancake coils of the interleaved turn, high series capacitance type. Electrically conductive means is disposed between predetermined turns of at least certain of the pancake coils, to provide the desired coil outside diameter, or to provide cooling ducts between the turns of the coil, or both.



The electrically conductive means provides these functions without introducing discontinuities into the desired predetermined capacitive structure of the pancake coils.

3,564,471
ELECTRICAL WINDINGS
Robert I. Van Nice, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania
Filed Dec. 10, 1968, Ser. No. 782,637
Int. Cl. H01f *15/14*
U.S. Cl. 336—70 **11 Claims**

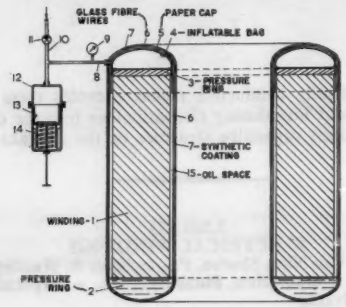


Electrical windings of the high series capacitance, interleaved turn type, having at least first and second parallel paths between its electrical ends. In a first embodiment of the invention, the windings include a plurality of electrically connected pancake coils, each having at least two parallel electrical paths, with the pancake coils at each electrical end of the winding being constructed to provide a voltage difference between the two electrical paths at line and surge frequencies, which is maintained throughout the remaining pancake coils. The remaining pancake coils are constructed with first and second conductors, continuously radially interleaved across the build of the pancake coil. In another embodiment, all of the pancake coils are of the continuous type, with each parallel circuit including impedance means which has substantially the same impedance as each of the pancake coils at surge frequencies, but negligible impedance at line frequency. In this embodiment, a voltage difference between adjacent turns of the first and second parallel circuits is created only during a surge potential.

3,564,472
WINDINGS FOR TRANSFORMERS OR CHOKE COILS

Egbertus Adrianus Frowein, Arnhem, Netherlands, assignor to Smit Nijmegen Electrotechnische Fabrieken N.V., Nijmegen, Netherlands, a company of the Netherlands

Filed Aug. 2, 1968, Ser. No. 749,870
Claims priority, application Netherlands, Aug. 14, 1967, 6711138; Feb. 12, 1968, 6801940
Int. Cl. H01j 27/30
U.S. Cl. 336—209 12 Claims

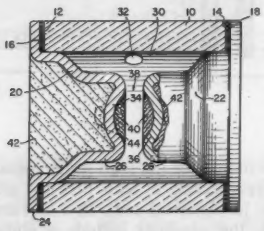


Transformer or choke coil winding wrapped in a torus-shaped envelope made from material which is adapted to be subjected to a tensile load in planes containing the axis of the winding, in which a pneumatically or hydraulically expandable bag is provided between one or each of both end faces of the winding and said envelope to exert axial pressure on the winding.

3,564,473
SURGE PROTECTOR

Chester J. Kawiecki, Santa Barbara, Calif., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill., a corporation of Illinois

Filed Nov. 21, 1967, Ser. No. 684,706
Int. Cl. H01h 79/00
U.S. Cl. 337—28 19 Claims

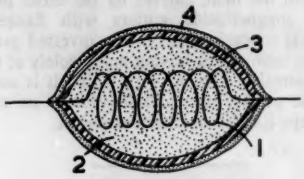


A miniature surge protector includes a pair of hollow electrode members extending within either end of a ceramic cylinder, such electrodes being brazed in position to complete a hermetic enclosure within the ceramic cylinder. The electrodes are provided with end walls which face one another within the cylinder to define a gap, and which are adapted to soften or melt under a prolonged continuation of an abnormal arc discharge across the gap. A means for making permanent contact between the electrodes, preferably including a fusible metal, is included within the hollow portion of each electrode. Such means is adapted to protrude through and make substantially permanent contact with the opposite electrode when the electrode end walls melt, whereby to provide a fail-safe feature.

3,564,474
ELECTRICALLY HEATABLE ELEMENTS

Jack Graham Firth, Burncross, near Sheffield, and Alfred Guest, Rotherham, England, assignors to National Research Development Corporation, London, England

Filed June 4, 1968, Ser. No. 734,474
Int. Cl. H01c 7/08; G01n 31/00
U.S. Cl. 338—25 3 Claims

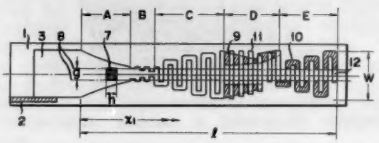


An electrically heatable element with a filament embedded in a fused ceramic material having a softening point not greater than 1500° C. has a catalytic material deposited on the outer surface of the fused ceramic.

3,564,475
VARIABLE RESISTANCE ELEMENT WITH MULTIPLE PATTERNS FOR MEASURING INSTRUMENTS

Tatsuo Fujii and Yutaka Watano, Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan, a Japanese corporation

Filed Oct. 15, 1968, Ser. No. 767,606
Claims priority, application Japan, Oct. 24, 1967, 42/68,036
Int. Cl. H01c 5/02, 9/02
U.S. Cl. 338—120 8 Claims



A variable resistance element is provided in which a film of material of known resistivity is deposited on a suitable plate in varying widths, a portion of the film being in a general serpentine pattern. A slidable contact of suitable width and height engages the resistance film and is movable relative thereto in a given path for varying the resistance value in a small step-wise manner. A resistance element of extended range may be provided by the addition of resistance film areas between incomplete loops of the serpentine pattern or added to complete the loops, the material of the second film having a higher resistivity than the first film. The slide preferably, engages only those portions of the first resistance film in the predetermined path.

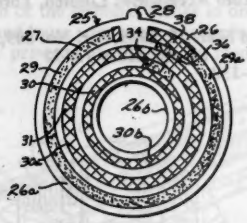
3,564,476
ELECTRICAL COMPONENT INCLUDING INTRINSICALLY EQUALIZED RESISTANCES

Wayne A. Barden, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind., a corporation of Indiana

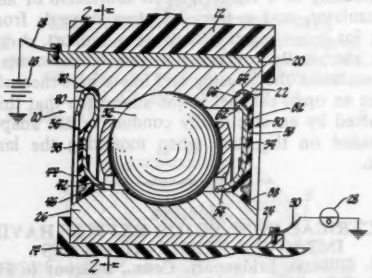
Filed July 30, 1969, Ser. No. 846,192
Int. Cl. H01c 9/04, 5/06
U.S. Cl. 338—120 10 Claims

An electrical component including a circuit module comprising a pair of fixed resistors, a resistance path for a variable resistance control, and a pair of collectors in spaced relationship to the resistance path disposed on a single substrate. One of the fixed resistors is electrically connected between one end of the resistance path and one of the collectors and the other fixed resistor is electrically connected between the two collectors. Contactor

means wipably engage the resistance path. Since the pair of fixed resistors and the resistance path are simultaneously formed on the same substrate they have the same relative electrical characteristics and, therefore, are intrinsically equalized.

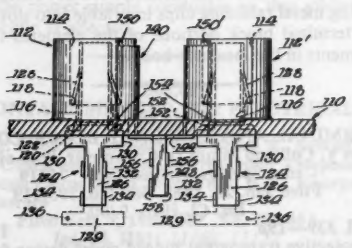


3,564,477
CONDUCTOR SEAL
Salvatore J. Pompei, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed Aug. 11, 1969, Ser. No. 848,963
Int. Cl. H01r *39/02;* **F16c** *19/00*
U.S. Cl. 339—5 **6 Claims**



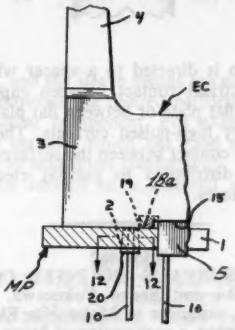
A ball bearing is equipped with an electrically conductive seal which both seals the annulus between the races and is adapted to carry an appreciable current between the races without damaging the balls. Electrical contact between the seal and the relatively rotating race is established by a plurality of fingers on the seal which are inboard of an annular sealing lip.

3,564,478
ELECTRICAL CONNECTOR AND GROUND STRUCTURE
Ike E. Hampton, Benton Harbor, Mich., assignor to V-M Corporation, Benton Harbor, Mich., a corporation of Michigan
Filed May 6, 1968, Ser. No. 726,977
Int. Cl. H01r *17/08, 13/42*
U.S. Cl. 339—14 **8 Claims**



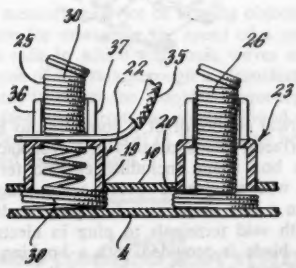
An electrical connector structure in which an electrical female connector is adapted to be insulatedly supported by a hollow boss which boss is associated with a plate-like support including an electrical ground structure.

3,564,479
MOUNTING MEANS FOR AN ELECTRICAL CONNECTOR
Glenn Harlan Gluntz, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Original application Aug. 21, 1967, Ser. No. 661,898, now Patent No. 3,480,904, dated Nov. 25, 1969. Divided and this application Aug. 21, 1969, Ser. No. 852,007
Int. Cl. H01r *13/10, 13/42*
U.S. Cl. 339—14 **2 Claims**



An electrical clip for grounding a post section of an electrical terminal to a metallic mounting panel has a base provided with U-shaped spring legs extending outwardly from the base in the same direction. The spring legs have springable post-engaging members directed towards the base. The base and the electrical clip is adapted to be disposed in an opening of the mounting panel with the post section extending through the opening and the post-engaging members resiliently engage the post section to effect an electrical connection between the metallic mounting panel and the post section.

3,564,480
TOY ELECTRONIC CONNECTOR KIT
Theodore D. Dziubaty, Plainfield, N.J., assignor to Remco Industries, Inc., Harrison, N.J.
Filed Sept. 4, 1968, Ser. No. 757,434
Int. Cl. H01r *7/28*
U.S. Cl. 339—18 **6 Claims**

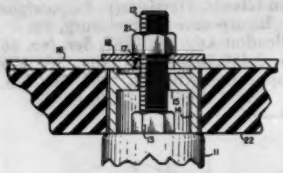


A toy solderless connector kit is provided for temporary or permanent wiring of electronic devices. The connector kit includes a wiring plate having therein a plurality of openings. A wire-retaining spring having an enlarged lower end is mounted in each opening and is secured in position by a base plate mounted below the wiring plate and pressing against the lower end of the spring. Wires are interconnected by placing them between the coils of a spring when in tension and then releasing the spring.

3,564,481
ELECTRICAL CONNECTOR

Marvin P. Young, Alexandria, Va., assignor to the United States of America as represented by the Secretary of the Navy

Filed Jan. 13, 1969, Ser. No. 790,644
Int. Cl. H01r *31/08*
U.S. Cl. 339—19 7 Claims

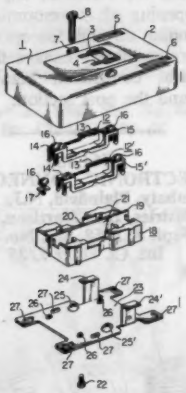


This invention is directed to a spacer which provides a long line electrical contact between capacitor output terminals and a flat plate or between flat plate conductors which carry very high-pulsed currents. The spacer provides a long line contact between the surfaces along which the current is distributed to prevent electrical arcing between the surfaces.

3,564,482
HOOK TYPE SURFACE MOUNTED CONNECTOR

Kiyoji Yamanaka and Sadao Fukuzawa, Kadoma-shi, Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan, a corporation of Japan

Filed July 3, 1968, Ser. No. 742,436
Claims priority, application Japan, July 7, 1967, 42/43,809, 42/58,845; Sept. 26, 1967, 42/81,965; Mar. 19, 1968, 43/21,760
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 3 Claims

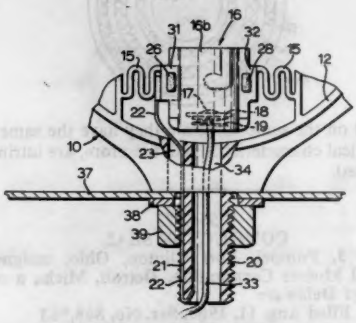


An electrical connector of a hook type to be mounted on wall surfaces, which consists of a receptacle substantially in a box shape including electric terminals for connection with an electric source, and a plug body substantially in a box shape including plug blades for connection with said terminals to plug in electric devices. Each plug blade is provided with a hooking means for engagement with an inside surface of the receptacle box adjacent to an inserting hole for the blade when the latter is inserted into contact relation with one of said terminals, and then pulled substantially downward along the terminal. The inserting and pulling operations provide both the electrical connection and a stable fixing of the plug body to the receptacle. The stable fixing may be improved by the provision of a hook receiving means in the plug body and a corresponding receiver means in the receptacle.

3,564,483
SIGNAL LAMP WITH BUILT-IN GROUND STRAP

Hugo Magi, Etobicoke, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada

Filed Mar. 21, 1969, Ser. No. 809,315
Int. Cl. H01r *13/32*
U.S. Cl. 339—130 7 Claims

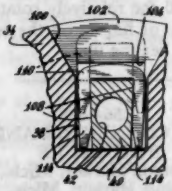


The housing of a signal lamp is fabricated of an electrical insulator, and a threaded stem depends from the housing for mounting the lamp on a support. A ground strap is electrically connected to one of the contacts of a bulb socket in the housing and has a part thereof positioned in an open channel in the stem such that this part is contacted by an electrically conductive nut adapted to be threaded on the stem when mounting the lamp in position.

3,564,484
ELECTRICAL CONNECTOR DEVICES HAVING IMPROVED TERMINAL MEANS

Carlo J. Gilberti, Bridgeport, Conn., assignor to Harvey Hubbell Incorporated, Bridgeport, Conn., a corporation of Connecticut

Filed Mar. 20, 1968, Ser. No. 714,513
Int. Cl. H01r *9/16*
U.S. Cl. 339—136 6 Claims



An electrical connector device including a protective housing within which is positioned an insulator body which supports removable terminal-contact elements having spring metal retaining clips insertable into slots formed in the terminal block portions of the elements to secure the elements in the insulator body.

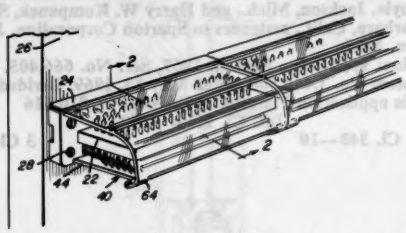
3,564,485
TERMINAL AND TERMINAL BLOCK COVER

John V. Cull and James D. Crownover, both of 2929 Cedar Springs, Dallas, Tex. 75219

Filed Jan. 23, 1969, Ser. No. 793,419
Int. Cl. H01r *9/00*
U.S. Cl. 339—198 11 Claims

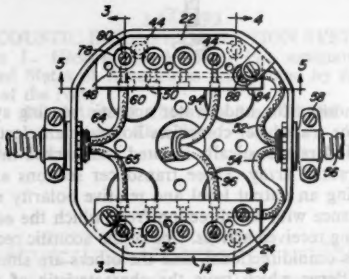
A protective transparent hinged cover device for covering the terminals on a conventional terminal block such as employed in the central switching stations of telephone

systems, telegraph systems, and other communication systems. The protective hinged cover device, or terminal guard, covers the terminals either on the top or on the bottom or both of the terminal blocks in order to prevent solder splash and loose wire scrap or clippings from shorting terminals, prevents the terminals from being bent,



protects the hands and arms of persons working in the vicinity of the terminal blocks from injury due to contact with sharp projecting terminals, is installed easily on existing terminal blocks with little or no modification of the terminal blocks and is constructed of transparent heat-resistant material to eliminate fire hazards.

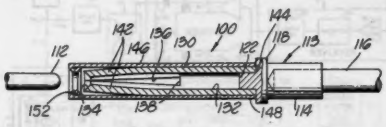
3,564,486
ELECTRICAL JUNCTION BOX
Xenophon G. Price, Hayesville, N.C., assignor of fifty percent to Gladys Kilpatrick, Murphy, N.C.
Filed Jan. 9, 1969, Ser. No. 793,642
Int. Cl. H01r *7/12, 13/22*
U.S. Cl. 339—217 **3 Claims**



A junction box device having a plurality of connector assemblies therein. Each connector assembly includes a block removably secured within the junction box housing. The block is characterized by an inwardly formed elongated passageway adapted to receive a stripped power supply conductor therein. A plurality of inwardly formed transverse passageways are disposed in spaced perpendicular relation to the first elongated passageway, each transverse passageway being adapted to receive additional strip conductors therein. Fastening means are provided by each transverse passageway for causing the deformation of each transversely extending conductor around the power supply conductor so that electrical interconnection is effected.

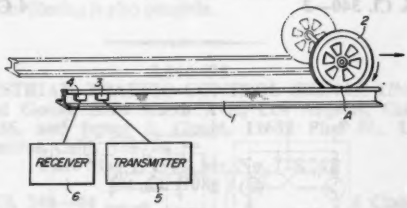
3,564,487
CONTACT MEMBER FOR ELECTRICAL CONNECTOR
Harlan R. Upstone, Arcadia, and Bruce K. Arnold, Pasadena, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y., a corporation of Delaware
Filed Feb. 3, 1969, Ser. No. 796,083
Int. Cl. H01r *11/08, 11/22*
U.S. Cl. 339—258 **3 Claims**

The disclosure relates to a socket contact for an electrical connector having an elongated contact body with rearwardly terminating means and having a tubular forward portion. The tubular forward portion containing a forward opening longitudinal slot therein has spring contact fingers having their roots at the rear end of the slot. A sleeve is provided above said fingers and secured proximate their roots thereof. The terminating means, the



spring fingers, and the sleeve means are each made of material which provides the desired performance parameter of that particular component. For example, the spring fingers utilize material which has good spring characteristics as well as maximum conductivity. The terminating means may be formed of a material which is readily crimpable.

3,564,488
SPEED MEASURING DEVICE OF MOVING OBJECTS
Akira Higashi, Musashino-shi, Masao Tsuboi and Kakutaro Wada, Koganei-shi, Taro Anzai, Fujisawa-shi, and Torao Suzuki, Yokohama, Japan, assignors to Hitachi, Ltd., and Japanese National Railways, both of Tokyo, Japan, both Japanese corporations
Filed June 16, 1969, Ser. No. 833,350
Int. Cl. G01s *9/66*
U.S. Cl. 340—1 **1 Claim**

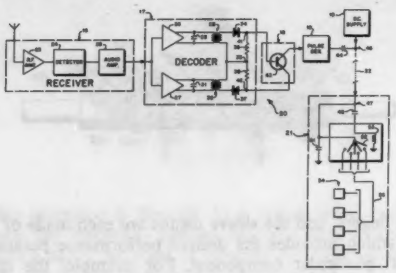


A speed measuring device of moving objects, in particular a device for measuring the speed of a moving body running on rails in which ultrasonic waves are sent out to at least one of the rails through a piezoelectrical transducer element to detect the Doppler frequency contained in the reflected wave from the neighborhood of the contact point between the wheel of the moving body and the rail for speed measurement.

3,564,489
RADIO COMMAND BUOY SYSTEM
Samuel Pure, Rydal, and James R. Howard, Huntingdon Valley, Pa., assignors to the United States of America as represented by the Secretary of the Navy
Filed Dec. 30, 1965, Ser. No. 517,800
Int. Cl. G01s *9/66;* **H04b** *1/00*
U.S. Cl. 340—2 **3 Claims**

A radio command buoy system having an RF command link for selectively operating from a remote station a plurality of remote underwater sound source buoys deployed in a water area of interest. A pair of manually operated selector switches pass two different tones from

a plurality of discrete tone generators and the selected tones are combined and transmitted on a carrier wave. Each buoy is a radio receiving station having a decoder responsive to a selected pair of different of said tones.



The decoder output operates a stepping switch connected between a power supply and a plurality of electrically fired explosive charges. Each time the decoder tones are transmitted, the stepping switch causes a succeeding charge to explode.

3,564,490

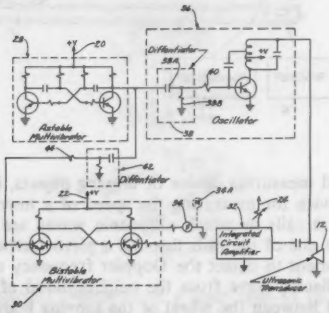
METHOD AND MEANS FOR MEASURING DEPTH OF WATER OR THE LIKE

Roger C. Camp, Ames, Iowa, assignor to Iowa State University Research Foundation, Ames, Iowa, a corporation of Iowa

Continuation of application Ser. No. 700,511, Jan. 25, 1968. This application Aug. 19, 1969, Ser. No. 854,020

Int. Cl. G01s *9/68*

U.S. Cl. 340—3 **4 Claims**



An electronic depth gauge wherein a low frequency pulse generator is connected to an ultrasonic transducer through an oscillator to emit a signal downward through a body of water or the like, with the reflected signal being received by the transducer and converted to a reflected voltage input. An amplifier is connected to the transducer to amplify the reflected voltage, which in turn is connected to a switching mechanism. The switching mechanism is connected to the low frequency pulse generator and a meter of the D'Arsonval type, which is graduated in feet and which measures average current values proportional to the time that the unit measures maximum depth with respect to the time that the switching mechanism is interrupted by the amplified voltage of the signal reflected from the bottom of the body of water.

3,564,491

DIRECTIONAL SONAR TRANSDUCER

Ernest A. Granfors, Don L. Loveless, and Charles F. Boyle, Jackson, Mich., and Harry W. Kompanek, Santa Barbara, Calif., assignors to Sparton Corporation, Jackson, Mich.

Original application Sept. 8, 1967, Ser. No. 666,405, now Patent No. 3,444,508, dated May 13, 1969. Divided and this application Mar. 26, 1969, Ser. No. 810,616

Int. Cl. H04r *1/40*

U.S. Cl. 340—10 **3 Claims**

A transducer for underwater acoustic sensing systems wherein the transducer comprises hollow piezoelectric ceramic cylinders acoustically isolated and stacked in a vertical interstitial array. Three transducer sections are utilized having an output level and relative polarity related in accordance with the direction from which the acoustic signal being received arrives. One of the acoustic receiving patterns is omnidirectional, and the others are sinecosine dipole patterns which have the characteristic of output level variation with bearing. The omni output provides an amplitude and phase reference for comparing the amplitude and polarities of the two bearing-sensitive signals. The resultant three signals, and compass information constitute the primary outputs of the sensing system which are transmitted to suitable decoding and radio transmission apparatus.

3,564,492

DEVICES FOR EMITTING ACOUSTIC WAVES IN A LIQUID MEDIUM

Pierre Magneville, Vernouillet, and Claude Duconge, Le Vesinet, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Malmaison, Hauts-de-Seine, France

Filed Nov. 21, 1968, Ser. No. 777,838

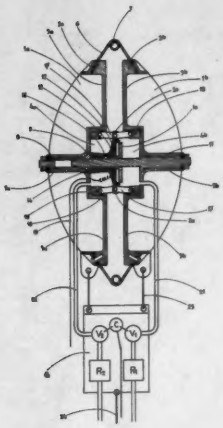
Claims priority, application France, Nov. 21, 1967, 129,124

Int. Cl. H04r *23/02*

U.S. Cl. 340—12 **16 Claims**

This device comprises at least two movable elements made of a rigid material and interconnected by a tightening membrane made of a deformable material which constitutes a tight enclosure with the movable elements. These elements have contact areas adapted to be applied intermittently against each other. Releasable means are provided for moving these elements away from each other and for locking them in spaced relationship to each other,

as well as means for limiting the deformation of the membrane toward the interior of the enclosure and means



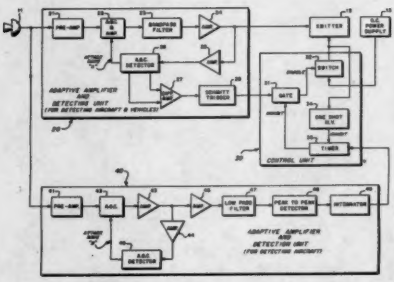
for creating in this enclosure a pressure much lower than the pressure prevailing outside the enclosure.

3,564,493

ACOUSTIC ENERGY DETECTION SYSTEM

William L. Hicklin, Doylestown, Pa., assignor to the United States of America as represented by the Secretary of the Navy

Filed Aug. 28, 1968, Ser. No. 756,350
Int. Cl. G08b *13/16*
U.S. Cl. 340—15 16 Claims



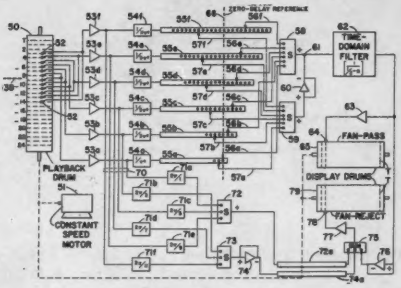
An acoustic energy system for passively detecting and distinguishing between ground vehicle sounds and aircraft sounds and for transmitting radio signals indicative of the ground vehicle sounds. The system includes an adaptive amplifier and detector circuit for detecting both ground vehicle and aircraft generated sounds and responding thereto for providing a first control signal, an adaptive amplifier and detector circuit primarily responsive to the more impulsive aircraft generated sounds for providing a second control signal, and transmitter ON-OFF control circuitry responsive to the first and second control signa s for activating a transmitter to transmit ground vehicle sound signals and for deactivating the transmitter in the presence of aircraft sounds.

3,564,494

FAN FILTERING SEISMIC DATA

Clint W. Frasier, Cambridge, Mass., and John L. Shanks and Sven Treitel, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla., a corporation of Delaware

Filed Sept. 27, 1966, Ser. No. 582,389
Int. Cl. G01u *1/28*
U.S. Cl. 340—15.5 1 Claim



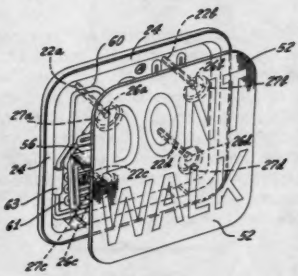
In fan filtering seismic data traces to discriminate for or against certain arrivals on the basis of their apparent moveout across an array of traces, the requirement for applying different time-domain filters to the different traces during the filtering operation is avoided by first applying a set of specific weighting factors and time delays to the traces, followed by summing with the proper polarities. Passing the summation trace through a particular single time-domain filter gives the same output as the more complex process using a different time-domain filter for each two traces of the array. Fan-rejection filtering is also possible.

3,564,495

PEDESTRIAN TRAFFIC CONTROL SIGNAL UNIT

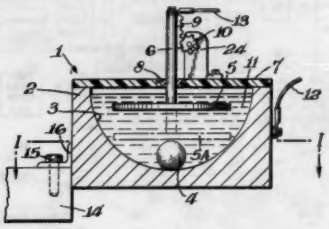
Samuel Gould, 5504 Garth Ave., Los Angeles, Calif. 90056, and James S. Gould, 11682 Pine St., Los Alamitos, Calif. 90720

Filed May 1, 1968, Ser. No. 725,741
Int. Cl. G08g *1/00*
U.S. Cl. 340—44 6 Claims



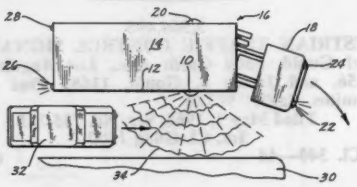
An improved pedestrian traffic crosswalk control signal unit of the "walk/don't walk" type is provided, which conforms in all respects with national safety standards, and yet which is less bulky in its construction than the prior art signal units, less expensive to build, and easier to ship without breakage.

3,564,496
CRITICAL ROLL ANGLE WARNING DEVICE FOR VEHICLES
Alfred P. Brooks, West Orange, N.J., and Aldo P. Osti, Richmond Hill, N.Y., assignors to Chas. Pfizer & Co., Inc., New York, N.Y., a corporation of Delaware
Filed Feb. 5, 1968, Ser. No. 702,938
Int. Cl. H01h 35/02
U.S. Cl. 340—52 **7 Claims**



Actuating switch comprising a cup-shaped lower contact in which a small, electrically-conductive ball rolls as the cup is displaced from the vertical and a horizontal upper contact which retains the ball within the cup, the upper contact being vertically movable manually or by electrical means in response to load and operating characteristics of the vehicle so as to vary the angle of actuation with a varying critical roll angle.

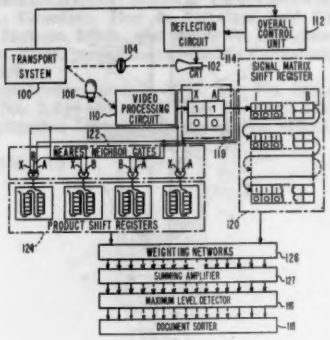
3,564,497
VEHICLE SIGNALLING SYSTEM
Joseph F. Gazzo, 1303 McKinley Ave., Des Moines, Iowa 50315
Filed Aug. 6, 1968, Ser. No. 750,617
Int. Cl. B60g 1/38, 5/00
U.S. Cl. 340—75 **4 Claims**



A device for signalling motorists and pedestrians by use of audio and visual signals directed directly at them that a vehicle is moving or is changing its direction. The signalling device is a localized message center positioned on the vehicle such as a semitruck at the point where danger exists thus alerting people to keep away. An important location for the signalling unit is on the right side of the trailer of a semitruck, to signal those in an area along the truck that cannot see the front and back truck turn signals and cannot be seen by the truckdriver.

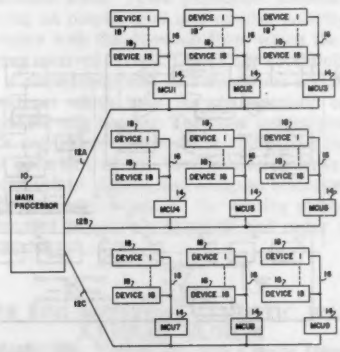
3,564,498
CHARACTER RECOGNITION SYSTEM
David M. Stern, Merion Station, Pa., assignor to Burroughs Corporation, Detroit, Mich., a corporation of Michigan
Continuation of application Ser. No. 522,916, Jan. 25, 1966. This application Oct. 31, 1969, Ser. No. 871,786
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 **7 Claims**

Apparatus for gating electrical signals from different combinations of neighboring ones of a few representative stages of a character recognition matrix shift register, the output of each of the gates being applied to the input terminal of a different auxiliary shift register which is shifted



synchronously with the primary shift register. Each auxiliary shift register thereby stores a logical function of signals representative of neighboring areas of the character field that is examined.

3,564,499
MESSAGE TRANSMITTING SYSTEM
Patrick Edward Ryan, Stamford, Conn., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif., a corporation of Delaware
Filed Jan. 25, 1968, Ser. No. 700,409
Int. Cl. H04q 9/00
U.S. Cl. 340—147 **14 Claims**



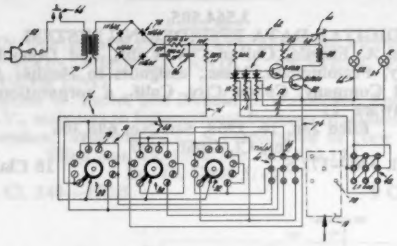
A system for transmitting messages from a central station to any selected one, or any selected combination, of remote devices while requiring that the central station transmit the message only a single time. A control unit is provided which unit has a memory with segments corresponding to each of the devices. Each message contains a destination code. The messages are applied by the central station to the control unit where the destination code is decoded and the message stored in the segments of the control unit memory corresponding to the device or devices for which the message is intended. The message in each segment of the control unit memory is subsequently transmitted to its associated device.

3,564,500

SYSTEM AND APPARATUS FOR VALIDATING AND VERIFYING OWNERSHIP OF CREDIT CARDS AND THE LIKE

Ralph V. Cook, 416 NW. 19th, Oklahoma City, Okla. 73103

Filed June 23, 1969, Ser. No. 835,626
Int. Cl. H04q 3/02
U.S. Cl. 340—149 5 Claims



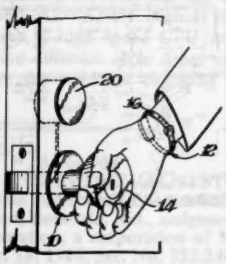
A system and apparatus for validating, verifying credit card and the like ownership, also usable for and in conjunction with, for example, determination of credit status of the owner, utilizing a known form of credit card having the usual visual identifying and recording means thereon. The card further includes a plurality of apertures therethrough arranged in coded positions to cooperate with selective plural light sources, the system being operable to activate only preselected ones of the light sources, as selected by a card owner or a clerk registering and recording a sale in accordance with a code number known only to the owner. Means are provided for receiving emitted light from the so activated light source passing through the coded apertures and operable when the user activated light sources correspond with the coded card apertures to activate, through light sensors, one or more interconnected electrical circuits to indicate visually validity or correct ownership of the card. Noncorrespondence of the preselected light source operation, coded apertures, and sensors, together with the circuits, serve to indicate nonverification of card. The system in conjunction with appropriate circuitry and additional apparatus also permits ascertaining credit standing or the like of a card bearer, or can serve to activate equipment extraneous to the system.

3,564,501

FREQUENCY CONTROLLED DOOR LOCKS

William M. Flook, Jr., Greenspring Road, Greenville, Del. 19807

Continuation-in-part of application Ser. No. 568,178, July 27, 1966. This application Sept. 21, 1967, Ser. No. 669,655
Int. Cl. H04g 9/10, 9/12
U.S. Cl. 340—171 6 Claims



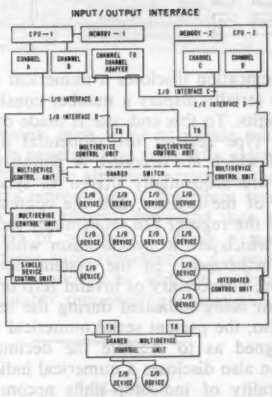
An electronic actuating arrangement includes both triggering means for operating an actuating device such as to permit the opening of a door, and lockout means for preventing operation of the triggering means in the absence of an input signal of precisely predetermined frequency, or in the presence of incorrect signals. An amplifier is provided which may incorporate a quartz crystal resonator filter which has either a peak or a null characteristic at a predetermined frequency. When the resonator has the null characteristic, the filter is used in the lockout channel of the arrangement. When it has the peak characteristic the filter is used in the actuate channel.

3,564,502

CHANNEL POSITION SIGNALING METHOD AND MEANS

William E. Boehner, Poughkeepsie, and Bruce L. McGilvray, Pleasant Valley, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Jan. 15, 1968, Ser. No. 697,797
Int. Cl. G06f 11/06
U.S. Cl. 340—172.5 25 Claims



Position information about an interrupted I/O device communicated to the CPU as a result of an error in its channel, even though no error occurred in the I/O device. The positional information about such I/O device is chosen in relation to the execution steps in a channel instruction, so that a retry may be made of the channel instruction being executed at the time of the channel error.

The recovery action to be taken at the I/O device for the same channel instruction varies with the positional information existing at the time of the channel error.

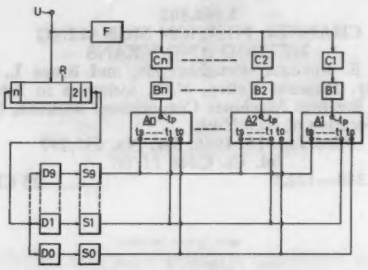
With start-stop I/O devices, the invention enables a retry of a single erroneously executed channel command both during a command chaining operation, as well as during non-chained command operations.

The channel-I/O interface is monitored by a time-position signaling circuit, which discretely cycles at different points in the execution of a channel instruction (or command) to an I/O device to generate codes representing respective time-positions during the execution. At the moment of a channel error, the input to the signaling circuit is blocked, so that it continues to provide the position code existing at the time of the channel error. The position code is transmitted into the channel status word of a computer system by a channel interrupt caused by the channel error. Then, the I/O movement condition existing at the time of the error is obtainable from information in the channel status word by relating the position code to the particular channel instruction, so that a retry of the channel instruction can be made.

3,564,503
NUMERICAL DISPLAY SYSTEM

Kikuo Kubo and Takafumi Kumagai, Kawasaki-shi, Kanagawa-ken, and Takeshi Shirai, Tokyo, Japan, assignors to Nippon Columbia Company Limited, Tokyo, Japan, a corporation of Japan

Filed Nov. 21, 1967, Ser. No. 684,755
Claims priority, application Japan, Nov. 28, 1966, 41/78,166, 41/78,167; Mar. 8, 1967, 42/14,941
Int. Cl. G11b *13/00*
U.S. Cl. 340—172.5 9 Claims

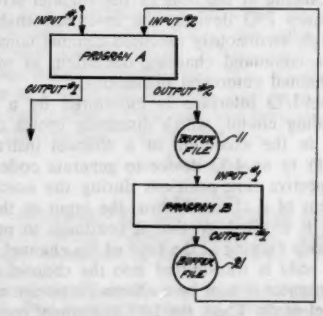


This specification discloses a numerical display system adapted to serially display a number consisting of a plurality of digits. To this end, use is made of a plural-digit circulating type register the sequential digit numerical contents of which are decoded. A plurality of numerical indicators are sequentially driven in synchronism with the period of the register, and the contents of the digit portions of the register are sequentially indicated on that indicators which are in synchronism with the sequential driving. Furthermore, in the system disclosed in this specification, unnecessary or invalid zero or zeros are prevented from being indicated during the serial numerical display. Also, the present serial numerical display system is so designed as to indicate the decimal point. This specification also discloses a numerical indicator comprising a plurality of indicator units accommodated in a single common tube.

3,564,504
METHOD AND SYSTEM FOR PROGRAM LINKAGE AND COMMUNICATION MECHANISM FOR COMPUTERS

Edward Morenoff, Rockville, Md., and John B. McLean, Utica, N.Y., assignors to the United States of America as represented by the Secretary of the Air Force

Filed Nov. 22, 1967, Ser. No. 685,102
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 7 Claims

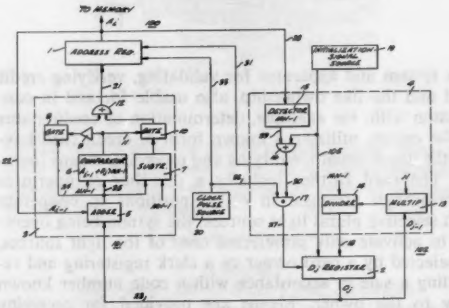


A method and system for program linkage and communication mechanism in computers. The basic feature of the technique is the insertion of a Buffer File into each data flow path from one program to another. A Buffer Fle Control Word containing control and state information is associated with each Buffer File. There is provided a capability for simultaneously manipulating up to eight Buffer File Control Words, symbolically referencing them in a program, and verifying and controlling a Buffer File's access rights.

3,564,505
DIGITAL DATA REORDERING SYSTEM

Charles A. Finnila, Culver City, Calif., and Donald S. Kelly, Framingham, Mass., assignors to Hughes Aircraft Company, Culver City, Calif., a corporation of Delaware

Filed Jan. 16, 1968, Ser. No. 698,306
Int. Cl. G06f *7/00*
U.S. Cl. 340—172.5 18 Claims

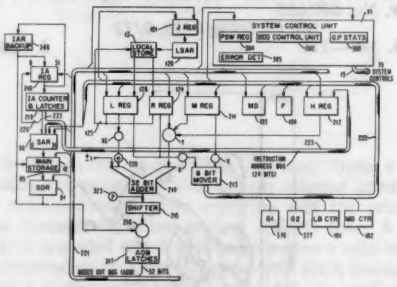


A digital reordering system for generating and supplying to a single random access memory a plurality of memory address sequences having a predetermined numerical relationship which is a function of and corresponds to the number of data elements in a data array to be stored in said memory thereby enabling data to be stored in said memory in a first time series and retrieved in a second time series.

3,564,506
INSTRUCTION RETRY BYTE COUNTER

Mark W. Bee, Hopewell Junction, and Donald J. Lang, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Jan. 17, 1968, Ser. No. 698,595
Int. Cl. G06f *11/10*
U.S. Cl. 340—172.5 8 Claims



Disclosed is a data processing system which upon detection of error during the execution of an instruction retries the instruction. Upon detection of error, the data processing system enters a retry mode of operation and

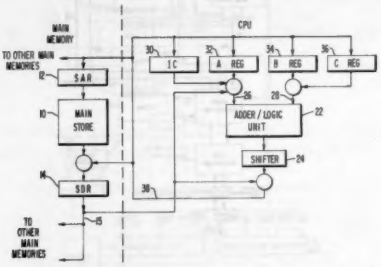
retrys the previously unsuccessfully completed instruction starting with the last successfully completed step as indicated by a counter which counts the number of successfully completed steps. Upon entering the retry mode, the count in the retry counter is used to update the addresses and operand length indicators thereby modifying the retry execution and taking advantage of previously error-free calculations.

3,564,507

ASYNCHRONOUS INTERFACE FOR USE BETWEEN A MAIN MEMORY AND A CENTRAL PROCESSING UNIT

Raymond W. Faivre and Donald E. Waldecker, Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Apr. 10, 1968, Ser. No. 720,124
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **9 Claims**



An asynchronous interface which selectively interrupts the clock pulses applied to a central processing unit thereby permitting a high speed central processing unit (CPU) to operate with a low speed main memory having a relatively long cycle time or with a plurality of main memories having different cycle times. The operation of the CPU is controlled by clock pulses. When the CPU selects a main memory and requests data at a specified address in the memory so that the data can be processed, a BUSY signal is generated for a predetermined following portion of the selected memory cycle. The BUSY signal interrupts the clock pulses so that another selection of the memory cannot be made until the memory is ready to accept the address of the data to be used in the next request at which time the clock pulses are again applied to the CPU. Since the access time of the memory may be so long that the requested data is not available at the memory output when the CPU is ready to accept and process the data, the clock pulses are interrupted for a predetermined time until the data is available, at which time an ADVANCE signal is generated by the memory to indicate the data will be available the next time the CPU is able to accept this data. By the use of memory-generated BUSY and ADVANCE signals to interrupt the CPU clock pulses, a high speed CPU may be used with memories having different cycle times and different access times without the need for changing the control logic in the CPU.

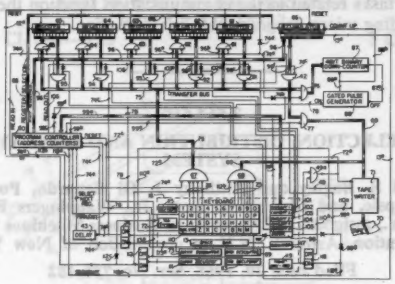
3,564,508

STORAGE AND RETRIEVAL SYSTEM

Ariadne L. Loewenthal and Rudolf Loewenthal, Rockville, and Gary M. Flynn, Bethesda, Md., assignors to Numo-Trans Data Corporation, a corporation of Maryland

Filed Apr. 18, 1968, Ser. No. 722,240
Int. Cl. G06f *15/02, 15/40*
U.S. Cl. 340—172.5 **17 Claims**

A desk-top data storage and retrieval system into which descriptor terms and bibliographic data are entered by a keyboard, the latter being stored propinquitiously with tag numbers of fixed format automatically generated by the entry of descriptor terms. In the retrieval mode, the operator enters a descriptor term as an interrogation of the system, which then automatically generates the appropriate tag number and matches it against stored tag numbers, and reads out such bibliographic data as it finds stored together with identical tag numbers. The tag number which represents each word or phrase making up a descriptor term is generated by arbitrarily assigning numbers to all letters of the alphabet, arranging the series of assigned numbers representing a descriptor term according to a matrix of horizontal rows and then adding the resulting columns of numbers to form a tag number. Plural tag numbers each representing a simple concept can be selectively combined by addition to form another combined tag number representing a compound concept.

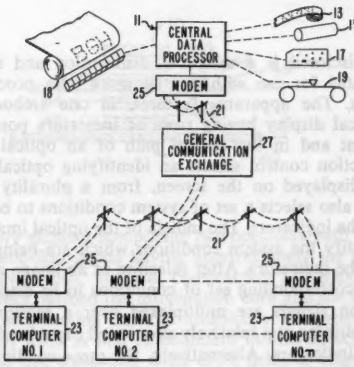


3,564,509

DATA PROCESSING APPARATUS

Cornelius C. Perkins, Birmingham, John H. Pedersen, Detroit, Hoy Ying Chang, Westland, and Michael M. Malmer, Jr., Livonia, Mich., assignors to Burroughs Corporation, Detroit, Mich., a corporation of Michigan

Filed Apr. 22, 1968, Ser. No. 723,088
Int. Cl. G06f *15/16, 15/40*
U.S. Cl. 340—172.5 **19 Claims**



A data processing system having a main data processor and a plurality of remote terminals each having data

processing capability. The main or central processor is coupled in a polling environment to the various terminal processors via a communication link. Communication or data transmission of each of the various peripheral or terminal processors to and from the central data processor is controlled by separate line discipline processors. A line discipline processor is coupled and responsive to the respective data processor at each remote site. The line discipline processor at each remote terminal edits and assembles the information to be transmitted and identifies, edits and assembles information received and performs other tasks related to the communication function thereby providing micro-programmed line discipline.

3,564,510

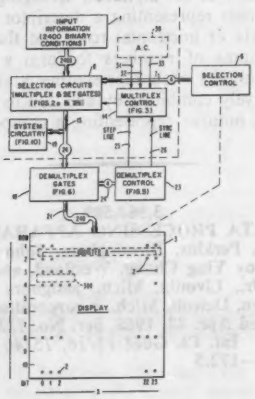
SELECTION, DISTRIBUTION AND DISPLAY SYSTEM

David S. Bagley and Anthony J. Di Benardo, Poughkeepsie, and Charles R. Doty, Jr., Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed June 20, 1968, Ser. No. 738,482

Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 **19 Claims**



Disclosed is a selection, distribution and display apparatus for use with one or more data processing systems. The apparatus features, in one embodiment, an optical display having rows of indicators positioned adjacent and in the optical path of an optical screen. A selection control selects an identifying optical image, to be displayed on the screen, from a plurality of images and also selects a set of system conditions to be displayed by the indicators. The indicia of the optical image selected identify the system conditions which are being displayed by the indicators. After selection of an image and thereby the corresponding set of conditions to be displayed, condition signals are multiplexed over a multiplex bus to the display at a relatively slow speed capable of energizing the indicators. Alternatively, the same conditions are selected and gated at fast system speeds and are distributed over the same multiplex bus to other system locations (e.g. system storage). Additionally, stored conditions previously sensed at fast system speeds may be retrieved from other locations and displayed at indicator speeds.

3,564,511

DATA TRANSMISSION SYSTEM HAVING A CENTRAL COMPUTER AND TERMINAL APPARATUS

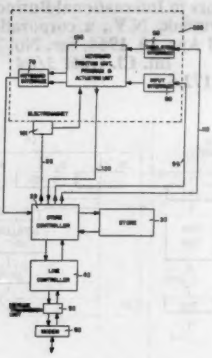
Francesco Restivo, Cascinette d'Ivrea, and Francesco Serracchioli, Banchette, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy, a corporation of Italy

Filed Oct. 3, 1968, Ser. No. 764,708

Claims priority, application Italy, Oct. 3, 1967, 53,221/67

Int. Cl. G06f *3/04, 15/16*

U.S. Cl. 340—172.5 **17 Claims**



A data transmission system having a central computer and terminal apparatus that transmits and receives data from the computer, the terminal apparatus having a programming unit that controls functions thereof and is responsive to service characters associated with blocks of characters constituting the data that is transmitted by the computer to cause programmed sequences of operation.

3,564,512

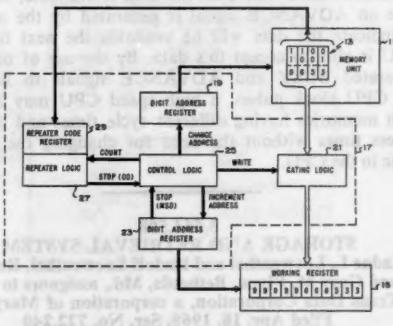
SYSTEM FOR COMPACTING AND EXPANDING DATA

Thomas E. Osborne, San Francisco, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif., a corporation of California

Filed Oct. 18, 1968, Ser. No. 768,643

Int. Cl. G06f *7/00*

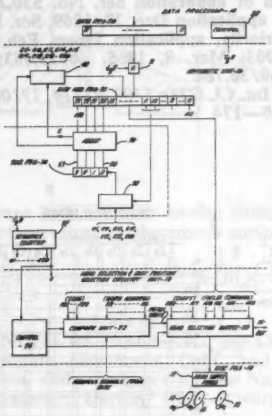
U.S. Cl. 340—172.5 **2 Claims**



A data system stores a multidigit number in a memory unit in compacted form. Each digit of a number is stored

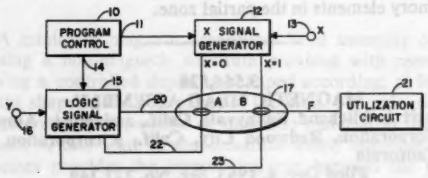
in the memory along with an associated repeater code. Data expansion logic writes an addressed digit from the memory into a working register in either one digit position or a plurality of successive digit positions, depending on the value of the associated repeater code.

3,564,513
ADDRESS TRANSLATOR
John A. Hibner, Sierra Madre, Calif., assignor to Burroughs Corporation, Detroit, Mich., a corporation of Michigan
Filed Jan. 31, 1969, Ser. No. 795,590
Int. Cl. G06f 7/28
U.S. Cl. 340—172.5 16 Claims



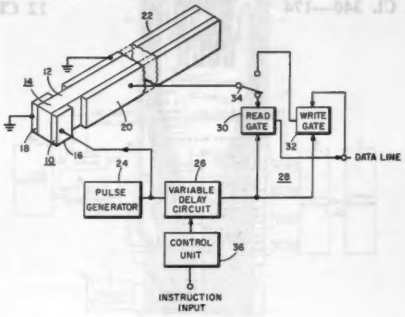
A rotating recording surface having a predetermined information format. A plurality of transducers read and write on the surface. A controllable transducer selection circuit and an angular position selection circuit selects a transducer and an angular position of a recording surface for reading and writing. An arithmetic unit receives a coded address designating a location to be accessed and converts the address to separate transducer selection and angular position selection signals for controlling the respective selection circuits.

3,564,514
PROGRAMMABLE LOGIC APPARATUS
Dale C. Gunderson, St. Anthony Village, Minn., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware
Continuation-in-part of application Ser. No. 618,486, Feb. 24, 1967. This application May 23, 1969, Ser. No. 827,207
Int. Cl. H03k 19/166, 19/20
U.S. Cl. 340—172.5 8 Claims



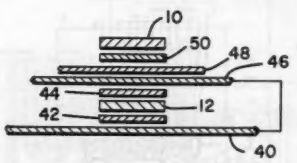
This disclosure shows two embodiments of a logic cell using two and five bistable memory cells per logic cell. The states of the memory cells can be changed or programmed to provide a variety of elementary logic functions.

3,564,515
INFORMATION HANDLING APPARATUS
Joseph W. Gratian, Rochester, N.Y., assignor to General Dynamics Corporation, a corporation of Delaware
Filed Jan. 30, 1964, Ser. No. 341,297
The portion of the term of the patent subsequent to Aug. 16, 1987, has been disclaimed
Int. Cl. G11c 11/22
U.S. Cl. 340—173 7 Claims



A memory storage system which uses the interaction of a traveling stress pulse and an electrical field to polarize a ferroelectric material to represent information.

3,564,516
MAGNETIC MEMORY ELEMENT HAVING INFORMATION CORE AND READOUT CORE
Frank R. Janisch, Savage, and William W. Davis, Minneapolis, Minn., assignors to Sperry Rand Corporation, New York, N.Y., a corporation of Delaware
Continuation of application Ser. No. 356,165, Mar. 31, 1964. This application Apr. 5, 1968, Ser. No. 722,815
Int. Cl. G11c 5/02, 11/14
U.S. Cl. 340—174 9 Claims



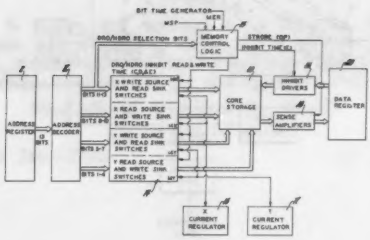
A memory element comprising two open-flux-path thin-ferromagnetic-film layers having approximately the same physical dimensions, material composition and magnetic characteristics, termed the information core and the readout core, each having uniaxial anisotropy for providing parallel easy axes. A first embodiment utilizes coincident longitudinal and transverse write drive fields to align the magnetization of the information core and the readout core in a parallel relationship; a subsequent transverse set drive field switches the magnetization of the readout core causing it to align itself anti-parallel that of the information core whereas each core partially closes the

otherwise open flux path of the other. A second embodiment utilizes coincident longitudinal and transverse write drive fields of relatively long duration and of gently sloping leading and trailing edges to align the magnetization of the cores anti-parallel each other.

3,564,517
COMBINED DRO AND NDRO COINCIDENT CURRENT MEMORY

William E. McLean, Hales Corners, Wis., and Hayden A. Nelson, Santa Barbara, and David E. Ruch, Goleta, Calif., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed June 24, 1968, Ser. No. 739,251
Int. Cl. G11c *5/02, 11/06, 17/00*
U.S. Cl. 340—174 **12 Claims**

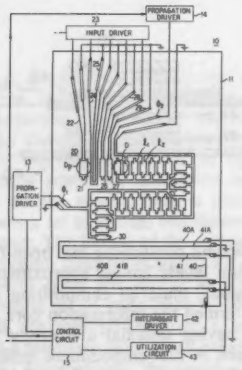


A coincident current magnetic core memory comprising a plurality of core matrices each having a scratch pad or alterable DRO section and a fixed NDRO section sharing conductors of one coordinate axis and the sense windings of each matrix.

3,564,518
MAGNETIC SINGLE WALL DOMAIN PROPAGATION DEVICE

Robert F. Fischer, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., a corporation of New York

Filed Apr. 4, 1969, Ser. No. 813,475
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 **5 Claims**

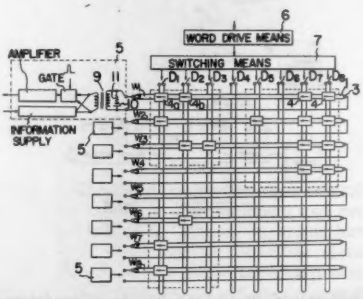


An overlay array of magnetically soft dots permits a reduction in the complexity of a drive wiring configuration for propagating single wall domains. The dots are offset with respect to the wiring configuration defining an astable position into which a domain is moved in each instance. Unidirectional movement of domains is ensured by the dots thus permitting two-phase propagation operation and a planar geometry for the wiring.

3,564,519
SEMI-PERMANENT MAGNETIC MEMORY ELEMENT AND A MEMORY MATRIX USING THEM

Shintaro Oshima, 28–7, 2-chome, Higashi-machi, Kichijoji, Musashino-shi, Tokyo-to, Japan; Yukio Nakagome, 1, 2-chome Nakamura, Nerima-ku, Tokyo-to, Japan; Tetsusaburo Kamibayashi, 130 Nobidome, Shinzamachi, Kitaadachi-gun, Saitama-ken, Japan; and Kitsutaro Amano, 4072–6 Kamitsuruma, Sagamihara-shi, Kanagawa-ken, Japan

Continuation of application Ser. No. 530,235, Feb. 25, 1966. This application Dec. 29, 1969, Ser. No. 888,148
Claims priority, application Japan, Feb. 27, 1965, 40/11,003; Mar. 8, 1965, 40/13,053; May 26, 1965, 40/30,780
Int. Cl. G11c *5/02, 11/14, 17/00*
U.S. Cl. 340—174 **7 Claims**



A memory element comprising a ferromagnetic film, a first conductor coupled with the ferromagnetic film, a second conductor arranged orthogonally to the first conductor and coupled with the ferromagnetic film, means for establishing a rest direction of magnetization the film in either of two different directions which correspond to binary information to be stored, and means for applying a drive signal to the first conductor. The direction of residual magnetism of the film is established on a predetermined line lying in the film and substantially in parallel with the first conductor, and said two different directions are substantially in parallel with either of the conductors, whereby an output signal having either of two opposite polarities determined in accordance with the binary information can be non-destructively read out from the second conductor when the first conductor is energized by the drive signal. A memory matrix in which memory cells of only a partial zone of the matrix are semi-permanently fixed by employing the above-mentioned memory elements in the partial zone.

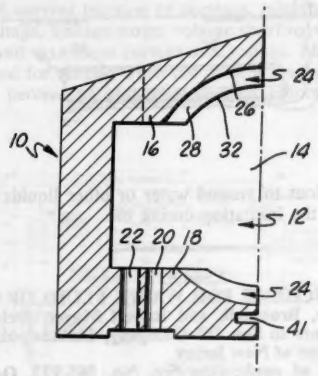
3,564,520
MAGNETIC HEAD ASSEMBLY

Robert A. Michaud, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif., a corporation of California

Filed Dec. 2, 1963, Ser. No. 327,349
Int. Cl. G11b *5/16, 5/28, 5/42*
U.S. Cl. 340—174.1 **10 Claims**

This invention relates to a magnetic head assembly and to a method for manufacturing such an assembly. More particularly this invention relates to a longitudinal type

of magnetic head assembly wherein a metal body includes an internal cavity with a radiused groove surface



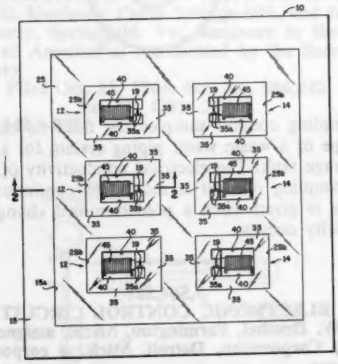
which receives a radiused core having substantially the same radius of curvature as the groove surface.

3,564,521

MINIATURE MAGNETIC HEAD

Cebern B. Trimble, Hawthorne, Calif., and Robert R. Skutt, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio, a corporation of Maryland

Filed Dec. 6, 1965, Ser. No. 511,843
Int. Cl. G11b *5/20, 5/28, 5/42*
U.S. Cl. 340—174.1 **5 Claims**



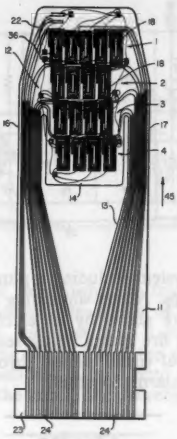
A miniature magnetic transducer head assembly comprising a non-magnetic substrate provided with recesses having a controlled depth and shaped according, at least, to the shape of the pole pieces of the head. The pole pieces are formed by deposition of magnetic material in the recesses. A thin wall of the substrate which separates the recesses provides the transducing gap between the pole pieces. A magnetic connecting path between the pole pieces is also provided on the substrate to form two parallel outer legs and a center leg. An exciting winding is wound manually around the center leg or can be formed by deposition.

3,564,522

TRANSDUCER WITH THIN FILM COIL AND SEMICONDUCTOR SWITCHING

William W. Stevens, Jr., Atherton, Calif., assignor to Data-Disc, Incorporated, Palo Alto, Calif., a corporation of Nevada

Filed Dec. 16, 1966, Ser. No. 602,212
Int. Cl. G11b *5/20, 5/42*
U.S. Cl. 340—174.1 **12 Claims**



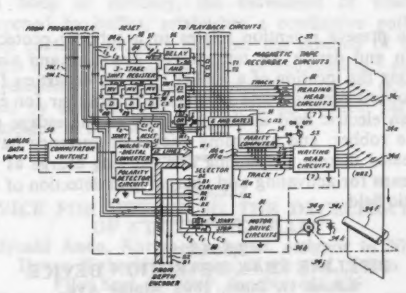
A magnetic transducer having a thin, flexible member which carries and supports transducer windings and a core of magnetic material carried by the member in coupled relationship to said windings.

3,564,523

MULTIPLE TRACK MAGNETIC TAPE RECORDING APPARATUS

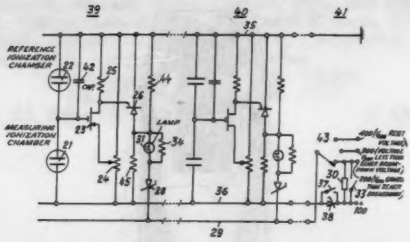
Arthur A. Cavelos, North Syracuse, N.Y., John S. Smith, London, England, and Bernard Viguerie-Noël, Westport, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y., a corporation of Texas

Original application Sept. 3, 1964, Ser. No. 394,174, now Patent No. 3,360,774, dated Dec. 26, 1967. Divided and this application Nov. 22, 1967, Ser. No. 685,114
Int. Cl. G11b *5/00*
U.S. Cl. 340—174.1 **8 Claims**



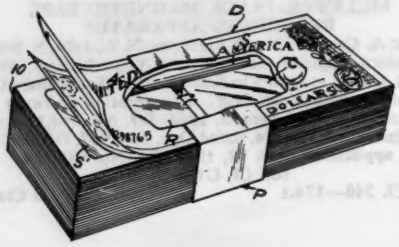
Apparatus is provided for the transfer of an information data signal having more bits than there are corresponding recording heads and tracks on the tape. Transfer of the information is accomplished by the successive recording of groups of bits which together comprise the information signal.

3,564,524
FIRE ALARM SYSTEM HAVING A DIODE COUPLED CHECKING CIRCUIT MEANS
Beat Walthard, Andreas Scheidweiler, and Max Kuhn, Stafa, Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland, a corporation of Switzerland
Filed May 4, 1967, Ser. No. 636,174
Claims priority, application Switzerland, May 9, 1966, 6,703/66
Int. Cl. G08b *29/00*
U.S. Cl. 340—214 **10 Claims**



A fire alarm system including a plurality of fire alarms arranged in groups. Alarm-simulating conditions are produced in each fire alarm by an electric test signal, the response of each fire alarm being sent to an evaluation device at a central signal station through a logic circuit coupling the fire alarms together.

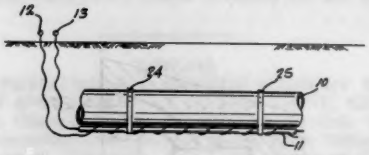
3,564,525
ROBBERY PROTECTION SYSTEM AND DEVICE FOR TEMPORARILY DISABLING A ROBBER AND VISIBLY MARKING HIS LOCATION
Harold J. Robeson, 2104 Clairmont Terrace NE., Atlanta, Ga. 30329, and Jerry L. Birchfield, Atlanta, Ga.; said Birchfield assignor to said Robeson
Filed Sept. 19, 1967, Ser. No. 668,903
Int. Cl. G08b *13/24;* **H04b** *7/00*
U.S. Cl. 340—224 **12 Claims**



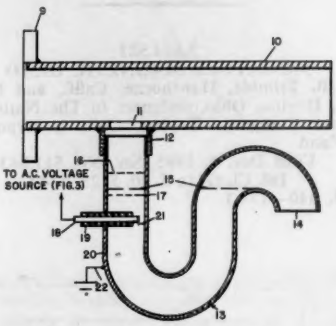
The present invention relates to a robbery protection system and device for temporarily disabling and visibly marking the location of a robber after his departure from the robbed premises and includes a transmitter for emitting an electric field in the proximity of the escape path of the robber, and a dummy packet of currency having concealed therein a disabling and marking charge as well as means for activating said charge upon detection of said electric field.

3,564,526
PIPELINE LEAK DETECTION DEVICE
Ernest O. Butts, 1002 Alpine Ave., Ottawa 14, Ontario, Canada
Filed Nov. 16, 1967, Ser. No. 683,553
Claims priority, application Canada, Dec. 23, 1966, 978,842
Int. Cl. G08b *21/00*
U.S. Cl. 340—242 **4 Claims**

A device for use in detecting leaks in a buried pipeline comprising a pair of conductors positioned beneath said pipe and spaced apart by an insulation which is degradable by the fluid contained within said pipe and substantially impervious to ground water or other liquids which may contact the insulation during use.



3,564,527
ALARM SCHEME FOR WASTE FLUID DRAIN
Julius Lerner, Broomall, and Robert Mayer, Delaware, Pa., assignors to Sun Oil Company, Philadelphia, Pa., a corporation of New Jersey
Continuation of application Ser. No. 585,933, Oct. 11, 1966. This application May 28, 1969, Ser. No. 831,261
Int. Cl. G08b *21/00*
U.S. Cl. 340—242 **4 Claims**

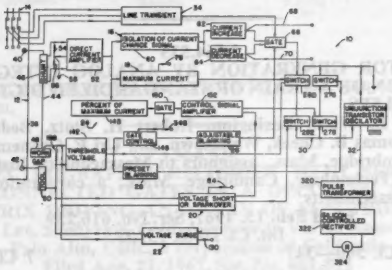


A sampling conduit samples the fluid flowing in the drain pipe of a waste water piping system for a floating-roof storage tank. The electrical conductivity of the fluid in the sampling conduit is monitored continuously, and an alarm is given when a predetermined change in this conductivity occurs.

3,564,528
ELECTRONIC CONTROL CIRCUIT
Robert W. Drushel, Farmington, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich., a corporation of Michigan
Continuation-in-part of applications Ser. No. 573,999, Aug. 22, 1966; Ser. No. 583,875, Oct. 3, 1966; Ser. No. 585,395, Oct. 10, 1966; and Ser. No. 595,189, Nov. 17, 1966, now Patent No. 3,471,750. This application Nov. 18, 1966, Ser. No. 595,442
Int. Cl. G08b *23/00*
U.S. Cl. 340—248 **13 Claims**

An electronic control circuit for use in conjunction with electro-chemical machining apparatus comprising means for simultaneously sensing a plurality of parameters of an electric circuit and providing an output signal when a parameter has an undesired characteristic, switching means operably associated with the sensing means for receiving the output signals from the sensing means, and means operably associated with and actuated

in response to the switching means for providing an output signal in accordance with the logic of the output signals received by the switching means operable to control the electro-chemical circuit and the corresponding control method. The parameters sensed include maximum current, current increase or decrease, minimum or threshold voltage, voltage surge, voltage shorting or gap spark-over, and maximum current and voltage. Means are also disclosed for sensing when the current reaches a predetermined percent of maximum current before the voltage



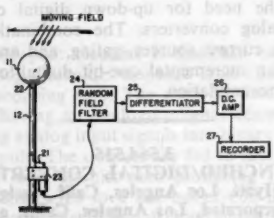
reaches a threshold value as a separate parameter, for preventing control in response to a sensed power line transient signal causing variation in machining circuit current and voltage, and for preventing an output signal to control the electro-chemical machining circuit during start-up for an adjustable predetermined period except when a voltage short or gap spark-over is sensed. A method of and means for indicating which parameter has provided the output signal due to an undesirable characteristic thereof is also disclosed.

3,564,529

ELECTROSTATIC FIELD RATE DETECTOR

Maxime G. Kaufman, Camp Springs, Md., and Joseph P. Dougherty, Springfield, Va., assignors to the United States of America as represented by the Secretary of the Navy

Filed Oct. 21, 1965, Ser. No. 500,442
Int. Cl. G01r *29/12*
U.S. Cl. 340—258 **1 Claim**



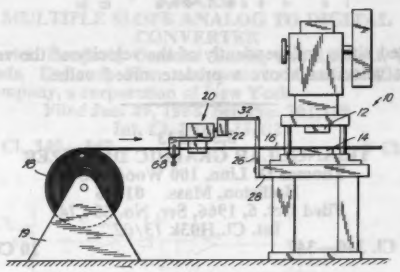
A system and method for electrostatically detecting the distance of one object from another utilizing a conductor placed in the electrostatic field of the moving object so that a rearrangement of charge on the conductor's surface occurs and this shifting of charge is directed through an impedance so that a voltage is developed which is a measure of the field strength causing the change in charge of the conductor. An input circuit, a differentiator, an amplifier, a recorder, and a sphere, as the conducting or detecting element, comprise the basic apparatus of this invention.

3,564,530

MATERIAL MONITORING SYSTEM

Herbert Kroeck, Central Islip, and Jerrold A. Krasny, New York, N.Y., assignors to Weldotron Corporation, Newark, N.J., a corporation of New Jersey

Filed May 22, 1968, Ser. No. 731,179
Int. Cl. G08b *21/00*
U.S. Cl. 340—259 **8 Claims**



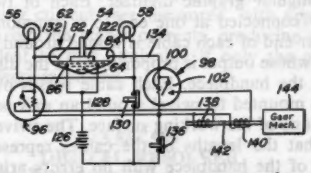
An apparatus for monitoring the thickness and width of a strip of material includes a pair of calipering rollers for monitoring the thickness and a pair of calipering plates for monitoring the width of the strip, all mounted on the block, and adapted to bind onto an oversize moving strip to move the block and thereby generate a stop signal.

3,564,531

BLADE ANGLE CONTROL DEVICE

Luther B. Burgin, P.O. Box 958, Poplar Bluff, Mo. 63901

Continuation-in-part of application Ser. No. 572,143, Aug. 12, 1966. This application July 24, 1967, Ser. No. 659,284
Int. Cl. G08b *21/00*
U.S. Cl. 340—282 **11 Claims**



A body of mercury, the movement of which is dampened by baffles, establishes a conductive path between contacts within a chamber the position of which reflects tilting of a grading blade of automatically correct the position of the blade. The sensitivity of the device is varied by adjusting the position of an element partially submerged in the mercury.

3,564,532

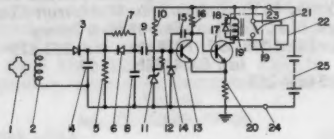
DEVICE FOR DETECTING THE DECELERATION OF A ROTATING SHAFT

Noriyoshi Ando, Kariya-shi, Japan, assignor to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan

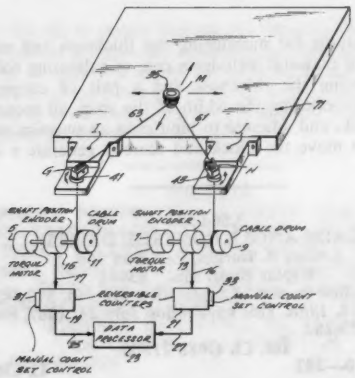
Filed Sept. 27, 1967, Ser. No. 671,076
Claims priority, application Japan, Oct. 3, 1966, 41/65,275; Nov. 9, 1966, 41/103,363
Int. Cl. G08b *21/00*
U.S. Cl. 340—262 **4 Claims**

The velocity of a vehicle attained during each acceleration is converted into a voltage and stored in a capacitor. Upon a decrease in the velocity or in the voltage, the capacitor discharges against that voltage to bring switch-

ing transistors into operation so that the deceleration of the vehicle may be indicated. The deceleration can be indicated either independently of the velocity of the vehicle or at velocities above a predetermined value.

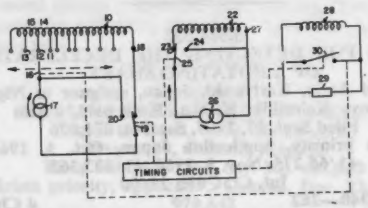


3,564,533
TRIANGULAR GRAPHIC DIGITIZER
Thomas D. Linn, 100 Woodland St., Holliston, Mass. 01746
Filed Oct. 6, 1966, Ser. No. 584,747
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **10 Claims**



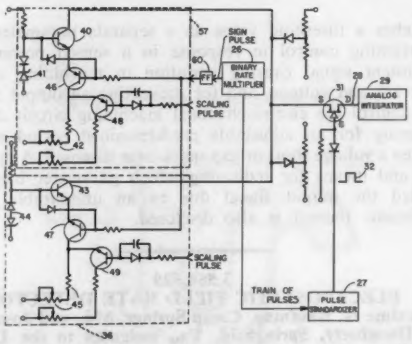
A triangular graphic digitizer. Each of two cables is pivotally connected at one end to a common handpiece. The other end of each cable is wound around a respective encoder whose output is proportional to the distance of the cable to the handpiece. Each cable passes over a pulley which is mounted to swivel around an axis perpendicular to the plane of the working surface. The swiveling pulleys insure that the lengths of the cables represent the true position of the handpiece with no errors arising because of changes in the directions of the cables.

3,564,534
MAGNETIC DIGITAL AMMETER
Peter E. Slavin, 25 Russell St., Woburn, Mass. 01801
Filed Jan. 3, 1967, Ser. No. 606,629
Int. Cl. H03k *13/02*; **G01r** *19/36*
U.S. Cl. 340—347 **3 Claims**



In a magnetic digital ammeter unknown analog currents are compared with known digital inputs in a single core for comparison purposes. The core has a magnetic characteristic of a high permeability at the origin with a very small cross-section whereby small magneto motive forces will saturate the core material. The comparison of the analog signals to the digital signals is accomplished by causing both magneto motive forces produced by the two signals to go toward zero and noting the polarity of the back electro motive force developed. The series of back E.M.F. or "kik" polarities is employed to alter the digital MMF so that it approaches the signal MMF in magnitude. The very small cross-section of the core permits rapid switching since a large net MMF decreases towards a minimal net MMF with little delay owing to the need for a large change of flux.

3,564,535
VECTOR GENERATION BY ANALOG INTEGRATION OF A TRAIN OF STANDARDIZED DIGITAL PULSES
John E. Ward, Lexington, Robert H. Stotz, Bedford, Thomas B. Cheek, Watertown, and Uri F. Gronemann, Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass., a corporation of Massachusetts
Filed Feb. 15, 1967, Ser. No. 616,239
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **7 Claims**

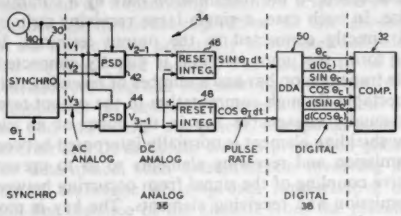


An improved vector generator for display devices comprising a dual binary rate multiplier, pulse standardizers, current sources, gating, and analog integrators, which eliminates the need for up-down digital counters and digital-to analog converters. The combination of pulse standardizer, current sources, gating, and analog integrator acts as an incremental one-bit digital-to-analog converter with accumulation.

3,564,536
SYNCHRO/DIGITAL CONVERTER
Gilbert P. Hyatt, Los Angeles, Calif., assignor to Teledyne Incorporated, Los Angeles, Calif., a corporation of Delaware
Filed Nov. 13, 1967, Ser. No. 682,043
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **11 Claims**

A synchro to digital converter capable of generating angle, sine, and cosine information in digital whole number and incremental form. Synchro signals applied to the converter are first transformed to AC analog form and thereafter to DC analog form. A digital computation means, such as a differential analyzer or stored program computer, subsequently operates on the signals to yield the desired information. The computation means implements a trigonometric identity and provides an error signal which is used to vary the output until the error is

reduced to zero. The computation means automatically compensates for any scale factor errors introduced in the

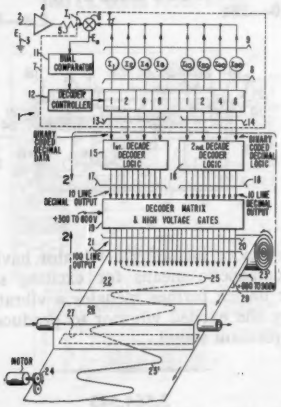


analog portion of the converter prior to the computation means.

3,564,537
ELECTROGRAPHIC RECORDER WITH SERIES CONNECTED GATES IN A DECODING MATRIX DRIVING AN ARRAY OF ELECTRODES

Fred Lee, Sunnyvale, Calif., assignor to Varian Associates, Palo Alto, Calif., a corporation of California

Filed Aug. 21, 1967, Ser. No. 661,872
Int. Cl. G03g *15/00;* H03k *13/02*
U.S. Cl. 340—347 5 Claims

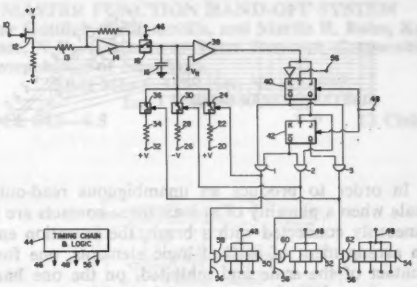


An electrographic recorder is disclosed employing an array of writing electrodes disposed crosswise of an electrographic recording web. The recorder includes an input channel having an analog-to-digital converter means for converting analog input signals into binary coded decimal data outputs. The outputs are fed to first and second digit decoder logic circuits each producing 10 line decimal output signals fed to a one-out-of-100 decoder matrix which decodes the 10 line decimal outputs to produce 100 line output for driving a 100 electrode array to record the input signal on the electrographic web. The one-out-of-a-100 decoder matrix includes a series connection of first and second high voltage gating transistors. There are 100 first gating transistors, there being one transistor for each of the electrodes of the writing array. The control electrodes for the first gating transistors are ganged together in groups of 10 with every tenth transistor ganged together and fed by one of the 10 line decimal outputs of the first digit decoder. There are 10 second gating transistors series connected with the first transistors with one transistor series connected with each group of 10 first transistor gates. The second gating transistors are driven from the output decoder signals derived from the second digit decoder. The series connected first and second gating transistors form a decoding matrix of 100 AND gates for applying the relatively high electrostatic writing potential to the selected writing electrode for reproducing the input signal on the recording medium.

3,564,538
MULTIPLE SLOPE ANALOG TO DIGITAL CONVERTER

Frederick Bondzeit, Ormond Beach, and Lewis J. Neelands, DeLand, Fla., assignors to General Electric Company, a corporation of New York

Filed Jan. 29, 1968, Ser. No. 701,189
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 3 Claims

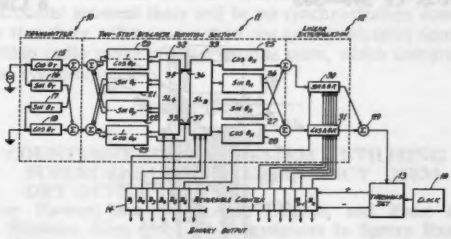


A capacitor is charged to a potential proportional to an analog voltage to be converted to a digital form. It is first discharged through the level of a reference potential by a relatively high constant current, it is next discharged in the reverse direction through the reference potential by a lesser constant current, and it is finally discharged in the first direction through the reference potential by a relatively low constant current. The durations of each of the discharging currents are measured, with appropriate weightings given the higher currents, producing an accuracy equivalent to that attainable if only the relatively low current were employed.

3,564,539
DIGITAL RESOLVER

Brock S. Dew, Watertown, Mass., assignor, by mesne assignments, to the United States of America as represented by the Secretary of the Navy

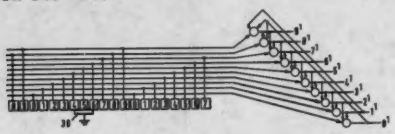
Filed Mar. 27, 1969, Ser. No. 811,046
Int. Cl. H03k *13/14*
U.S. Cl. 340—347 9 Claims



A digital resolver is disclosed which rotates an input vector from a shaft angle transmitter in accordance with the number in a binary counter to achieve a null. The rotation is performed in three stages, two of which provide

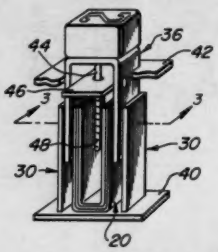
for large, exact, discrete rotations and the third for a linear approximation. When a null is achieved, the angle through which the input vector has been rotated represents the angular position of the transmitter shaft. The resolver may be used either to control the angular position of the shaft or to read out the shaft angle of the transmitter as a binary number.

3,564,540
ELECTRICAL DIGITAL SCALE
David S. Evans, Kent, England, assignor to Moore Reed (Industrial) Ltd., Walworth, Andover, Hampshire, England, a corporation of the United Kingdom
Continuation-in-part of application Ser. No. 554,573, June 1, 1966. This application Aug. 27, 1969, Ser. No. 853,276
Int. Cl. G08c 9/08
U.S. Cl. 340—347 **4 Claims**



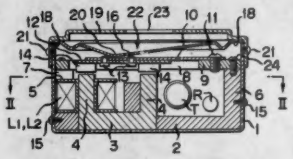
In order to produce an unambiguous read-out of a scale when a plurality of at least three contacts are simultaneously connected with a brush, the invention employs an arrangement of earthed logic elements, one for each contact of the scale and inhibited, on the one hand, by any of a plurality $(n-1)$ of input signals constituted by the output signals of the logic elements of the next higher or lower contacts, which can be simultaneously connected with the brush, as the case may be, and, on the other hand, by an input signal being an inhibiting signal fed through a line connecting the logic element concerned with its contact, so that when the logic element is earthed, it will produce an output signal only if the logic element at least one of the said next higher or lower contacts, as the case may be, is not producing an output signal. As a result when three or more contacts are simultaneously connected with a brush, the logic element of one must necessarily produce an output signal and thus inhibit the logic elements of the other contacts.

3,564,541
SWITCHING MECHANISM
Donald C. Gove, Manchester, Mass., assignor to Ikor, Incorporated, Burlington, Mass., a corporation of Massachusetts
Continuation-in-part of application Ser. No. 607,563, Jan. 5, 1967. This application Dec. 16, 1968, Ser. No. 783,959
Int. Cl. G08c 9/02
U.S. Cl. 340—365 **6 Claims**



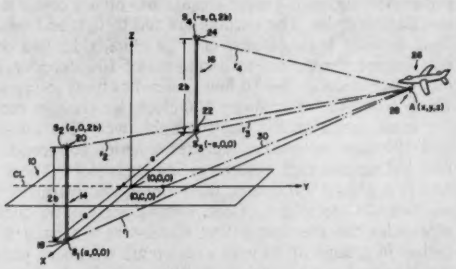
The following specification describes a switch in which one or more conductive transmission bars are connectable to an input terminal and one or more discrete, conductive receiving strips are each connectable to an output terminal. The input terminal is intended to be connected to a source of a signal of changing potential, and in one form is connectable to the transmission bars by a commutating device. In such case, a single large receiving strip can be used directly connected to the output terminal. In another form, the input terminal is directly connected to a single transmission bar and a number of receiving strips are connectable through commutation to the output terminal. A manually engageable key in the form of an electrostatic shielding element is normally interposed between the transmission and receiving elements so as to prevent capacitive coupling of the signal from occurring between the transmission and receiving elements. The key is movable to a position at which apertures in the key permit coupling and thus switching to occur. The key can, by virtue of the number and placement of apertures in it, directly encode the signal into a given numerical form defined by selective energization of the input terminals, and hence forms a basic element for a multiple key keyboard.

3,564,542
BUZZER HAVING CONVEX THIN FILM SOUNDING MEMBER
Yukio Arai, Chiba, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan
Filed Feb. 11, 1969, Ser. No. 798,316
Claims priority, application Japan, Feb. 14, 1968, 43/9,052
Int. Cl. G08b 3/10
U.S. Cl. 340—384 **9 Claims**



A buzzer device including a vibrator having a magnet and electromagnetic means for exciting said vibrator. The buzzer device further includes a vibration film that is struck by the excited vibrator to produce a relatively strong but pleasant sound.

3,564,543
AIRCRAFT LANDING CONTROL SYSTEM
Isaac D. Nehama, Bethesda, Md., and Clarence A. Lovell, McLean, Va., assignors to Air Land Systems Co., Fairfax, Va., a partnership of Virginia
Filed Sept. 5, 1968, Ser. No. 757,667
Int. Cl. G01s 9/04, 9/56
U.S. Cl. 343—6.5 **19 Claims**



A versatile all-weather landing control system is disclosed, the aircraft landing control system being capable of landing aircraft in zero-zero visibility with the same

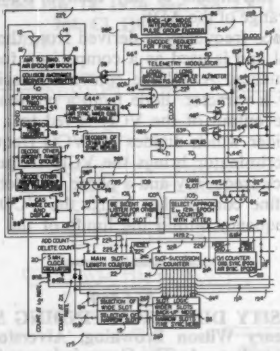
time spacing between aircraft as is achieved during normal, unlimited visibility landings. The subject invention contemplates the provision of a plurality of receiving antennas and/or transmitting antennas disposed in a predetermined geometric configuration on the ground adjacent the runway and preferably in symmetrical relationship to the center line thereof. The aircraft to be landed also carries receiving and transmitting equipment of varying complexity as desired. Through interaction of the ground and "on board" equipment, the spatial position of the aircraft and its deviation from a prescribed glide path can be determined, such determination involving a "trilateration" technique utilizing data represenative of the straight-line distance of the aircraft from the plurality of antennas on the ground. Once the aircraft position is known, guidance of the aircraft to landing is possible in a safe and accurate manner, the landing of the aircraft either being effected manually by the pilot or being effected by the "auto-pilot" system or the like on the aircraft, the actual guidance data either being computed on the ground or on the aircraft itself.

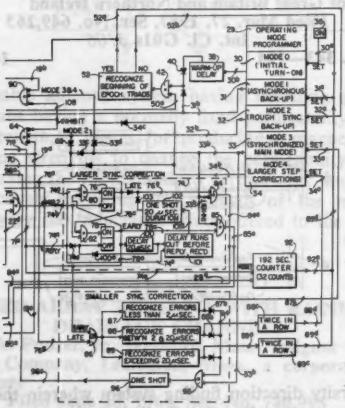
3,564,544

MULTIPLE MODE AIRCRAFT CLOCK SYNCHRONIZATION

William V. Scott, Depew, and William T. Lennon, Jr., Tonawanda, N.Y., assignors to Sierra Research Corporation, a corporation of New York

Filed Jan. 2, 1969, Ser. No. 788,560
Int. Cl. G01s *9/56, 9/10*
U.S. Cl. 343—6.5 **25 Claims**





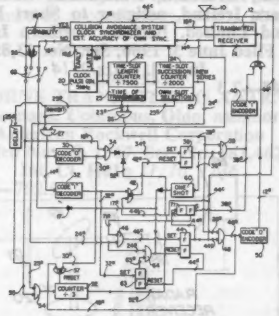
A system for synchronizing aircraft clocks to an established master time, the clocks having varying degrees of stability and these degrees establishing different modes of local operation, depending upon momentary estimates of local clock accuracy; and the different modes including graduated rates of clock correction, as well as the selection of time slots in different series designated for occupancy by aircraft having estimated clock errors of different magnitudes, the system including an asynchronous back-up mode occupied by aircraft whose clocks are entirely out of synchronization. The system further includes means for selecting unoccupied slots, for establishing coarse synchronization in one mode, for then proceeding by proportional clock correction to modes of higher degrees of synchronization, and for changing to appropriate other unoccupied time slots and reducing the magnitude of subsequent clock corrections as a result of improvement in the degree of clock synchronization.

3,564,545

MASTER FUNCTION HAND-OFF SYSTEM

Lothar Gottlieb, Williamsville, and Martin R. Bates, Kenmore, N.Y., assignors to Sierra Research Corporation, a corporation of New York

Filed May 6, 1969, Ser. No. 822,195
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 **12 Claims**



In a system for synchronizing a plurality of mobile units to a repeating cycle of time slots comprising an established worldwide or system-wide time base to which the various mobile units are synchronized, but to different degrees, the present improvement is based upon the fact that some units are well synchronized and can become synchronization donors with respect to other less-well synchronized units, and that there are substantial benefits to be obtained from frequently handing-off the master function among those well-synchronized units. The present system provides means for accomplishing this handing-off of the function of synchronization donor in an orderly manner which will minimize the likelihood that an any particular moment there will be no synchronization donor or that there will be more than one synchronization donor within radio range of other mobile units, which comprise the synchronizees.

3,564,546

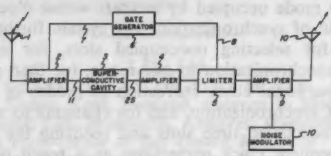
COUNTERMEASURES SYSTEM UTILIZING SUPERCONDUCTIVE FREQUENCY MEMORY DEVICE

Kay Howard Barney, Roslyn Heights, and Peter K. Shizume, Glen Oaks, N.Y., assignors to Sperry Rand Corporation, Great Neck, N.Y., a corporation of Delaware

Filed Aug. 10, 1959, Ser. No. 832,869
Int. Cl. G01s *7/42;* **H01p** *7/06*
U.S. Cl. 343—18 **10 Claims**

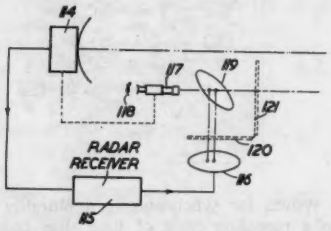
8. A countermeasures system comprising means for receiving pulsed microwave signals emitted by a victim

radar, a superconductive resonant cavity coupled to said means for receiving, said cavity being dimensioned so as to support a multiplicity of modes of oscillation within the frequency spectrum of the victim radar signals, means



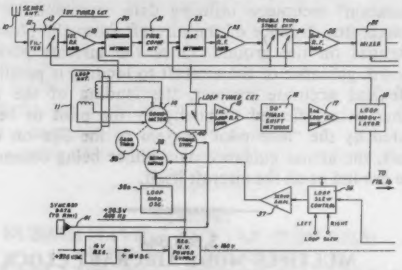
for maintaining the temperature of said resonant cavity below the superconductive transition temperature, and means for coupling out and transmitting back to the enemy radar the oscillations present in said resonant cavity.

3,564,547
RADAR APPARATUS FOR MISSILE GUIDANCE CONTROL
John Dent, Greenhill, Dundonald, County Down, Northern Ireland, assignor to Short Brothers & Harland Limited, Belfast, Northern Ireland
Filed June 3, 1960, Ser. No. 33,859
Int. Cl. G01s *9/14*
U.S. Cl. 343—7.3 **3 Claims**



1. Missile guidance apparatus for use in homing a missile on to a target comprising:
means for irradiating the target and the missile with pulsed radar signals,
a signal receiver for receiving in a common channel pulsed radar signals reflected from the target and pulsed radar signals reflected from the missile,
means for separating the target signals from the missile signals,
a signal processing circuit,
means for feeding the separated target signals in one time-division channel and the separated missile signals in another time-division channel through said signal processing circuit common to the two time-division channels,
means for producing on a screen continuous displays of an image of the target and an image of the missile,
said signal receiver comprising a radar scanner adapted to be so controlled as to track the target,
an optical viewing system arranged to be driven so as to follow the movements of the radar scanner and thereby track the target, and
means for optically projecting the said display of the target and missile so that an observer can observe an image thereof superimposed upon the optical image of the optical viewing system.

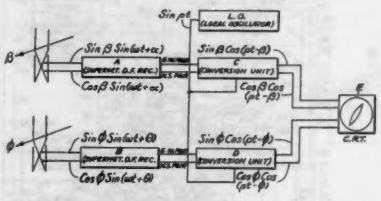
3,564,548
METHOD AND APPARATUS FOR CRYSTAL CONTROLLED AUTOMATIC DIRECTION FINDER
Ronald E. Grillot, Olathe, Kans., and James G. Farrar, Lee's Summit, Mo., assignors to King Radio Corporation, Olathe, Kans., a corporation of Kansas
Filed June 10, 1968, Ser. No. 735,853
Int. Cl. G01s *3/42*
U.S. Cl. 343—117 **33 Claims**



A crystal controlled ADF (Automatic Direction Finder) utilizes a stabilized master oscillator (SMO) and a single reference crystal to provide digital frequency selection in preselected increments of any desired frequency within the tuning range of the ADF.

A reference frequency is derived from the single reference crystal and is used as a comparison for a newly selected frequency. A voltage controlled oscillator (VCO) is tuned by a varactor diode from a portion of the SMO circuit. The output of the VCO is fed to a variable frequency divider which divides the VCO frequency. A frequency discriminator brings the VCO frequency close to the reference frequency and a phase detector provides the additional fine control that brings the VCO to the exact selected frequency within the limits of the crystal reference.

3,564,549
DIVERSITY DIRECTION FINDING SYSTEMS
Samuel Henry Wilson Browning, Alverstoke, Gosport, England, assignor to The Commissioners for Executing the Office of Lord High Admiral of the United Kingdom of Great Britain and Northern Ireland
Filed Mar. 27, 1957, Ser. No. 649,263
Int. Cl. G01s *3/06*
U.S. Cl. 343—121 **10 Claims**



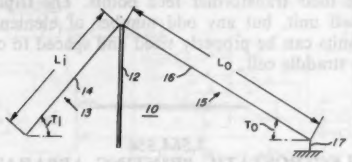
Diversity direction finding system wherein the outputs of two or more direction finding stations are combined using conversion units having a common local oscillator giving a reference phase to hold the conversion units in phase alignment.

3,564,550

ASYMMETRICALLY INCLINED RHOMBIC ANTENNA

Joseph T. de Bettencourt, West Newton, Mass., assignor to Raytheon Company, Lexington, Mass., a corporation of Delaware

Filed Mar. 29, 1967, Ser. No. 626,780
Int. Cl. H01q 11/06
U.S. Cl. 343—733 2 Claims



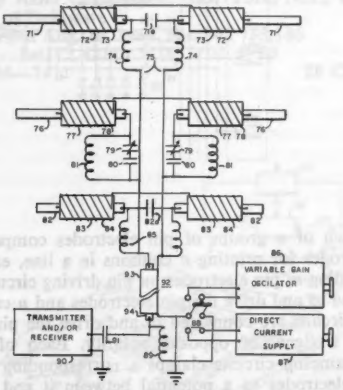
An antenna array employing asymmetrically inclined "rhombic" antenna elements in which the side length L_i, semi-acute angle A_i, and incline angle T_i to the horizontal of the input V section differs from the side length L_o, semi-acute angle A_o, and incline angle T_o, of the output or terminating V section of the "rhombic" element.

3,564,551

DIPOLE ANTENNA WITH ELECTRICALLY TUNED FERRITE SLEEVES

Harry A. Mills, 5904 32nd St. NW., Washington, D.C. 20015; Edward Lipson, 2105 Belvedere Blvd., Silver Spring, Md. 20902; and Noel R. Nelson, 12813 Camelia Drive, Wheaton, Md. 20906

Filed Jan. 14, 1970, Ser. No. 2,871
Int. Cl. H01q 9/16
U.S. Cl. 343—747 2 Claims



A tunable antenna system having radiating elements with means having a normally fixed permeability associated therewith, a means for producing a magnetic field of varying strengths to change the permeability of the means having the normally fixed permeability and means for selectively adjusting the strength of the magnetic field to vary the inductance effect offered to the radiant energy.

3,564,552

PHASED ARRAY ANTENNA WITH RAINFALL DRAINAGE CHANNELS

George A. Fraizer, Jr., Westford, Mass., assignor to Raytheon Company, Lexington, Mass., a corporation of Delaware

Filed June 28, 1968, Ser. No. 740,993
Int. Cl. H01q 1/48, 13/00
U.S. Cl. 343—778 12 Claims

A phased array antenna being protected against rainfall, comprising an antenna support structure; a plurality of radiating elements each being raised away from said support structure a sufficient distance to permit the maximum projected rainfall to flow through the channels

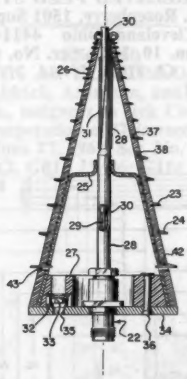
formed by raising the elements; and, means for connecting the array elements together at the front edges to simulate the existence of a continuous ground plane.

3,564,553

AIRBORNE TRANSMITTING ANTENNA

James D. Leonard, Columbus, Ohio, assignor to North American Rockwell Corporation

Filed Nov. 8, 1967, Ser. No. 681,462
Int. Cl. H01q 11/10, 1/36
U.S. Cl. 343—792.5 3 Claims



An airborne transmitting antenna assembly having a dielectric base portion is provided with essentially flat conductors that are edge-mounted onto the dielectric to obtain a significantly increased power-handling capability without adversely affecting other antenna performance characteristics such as radiation patterns, radiation axial ratios, and the like.

3,564,554

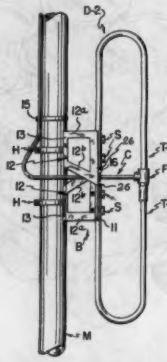
FOLDED DIPOLE AND MOUNTING ASSEMBLY

John Schuller, South Euclid, Ohio, assignor to Allen Electric & Equipment Company, a corporation of Michigan

Filed Aug. 12, 1968, Ser. No. 751,840
Int. Cl. H01q 9/26
U.S. Cl. 343—803 9 Claims

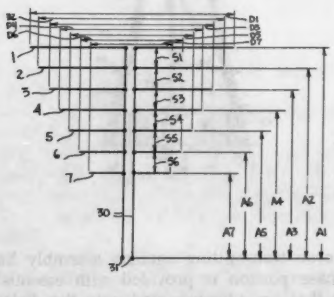
The aligned opposed legs of tubes bent into similar elongated U-shapes are secured mechanically in align-

ment as a folded dipole by a feed connection fitting between one aligned leg pair, and by bolting of the other pair to a narrow seat on the edge of a sheet metal bracket, having spaced parallel folded sides terminating in inwardly offset flanges curved for seated, rotationally adjustable, securement on a cylindrical mast by hose clamp



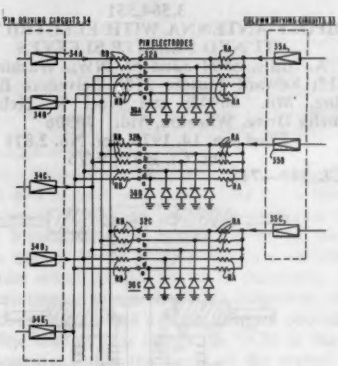
type clamping straps. The feed cable, passing through a grommeted bracket aperture, is mechanically and electrically connected with the fitting, and thereby to the tubular members, in a design facilitating fabrication and assembly, especially of a plurality of assemblies on a mast.

3,564,555
BROAD BAND TRANSFORMER ANTENNA AND RELATED FEED SYSTEM
Raymond A. Rosenberry, 1501 Superior Bldg., Cleveland, Ohio 44114
Filed Jan. 10, 1968, Ser. No. 696,762
Int. Cl. H01q *11/04, 21/12*
U.S. Cl. 343—811 **10 Claims**



A broad band transformer antenna having a series of overlapping triplet element cells in a fishbone type of arrangement of successively shorter element lengths. Each element of a triplet is shorter than and spaced from the preceding element by such calculated increment as will cause the straddling elements, as well as all other elements of the series, to be phased the same electrically in relation to the resonant element, and cause the straddling elements to have counter-balancing currents, voltages and reactive components with respect to the central resonant element to eliminate surge impedance and create a null reactance system with respect to a free space wave. The impedance at the terminating feed point of any resonant element in an active triplet is uniform at the applied resonant frequency; each element length and impedance is coordinated to its transformer line length and impedance to produce the desired matched impedance at the transmission line feed point, and excellent broad banding is achieved with relatively few elements. At any selected frequency within the antenna range, the elements of the non-active triplets present substantially infinite impedance to their transformer feed points. The triplet is the basic cell unit, but any odd number of element or element units can be properly sized and spaced to constitute such a straddle cell.

3,564,556
ELECTROSTATIC PRINTING APPARATUS
Kenmi Tsukatani, Mitaka-shi, and Makoto Ohta, Tokyo, Japan, assignors to Fujitsu Limited, Kawasaki, Japan, a corporation of Japan
Filed Feb. 20, 1969, Ser. No. 801,066
Claims priority, application Japan, Feb. 23, 1968, 43/11,506
Int. Cl. G01d *15/06;* **H04l** *15/34*
U.S. Cl. 346—74 **7 Claims**

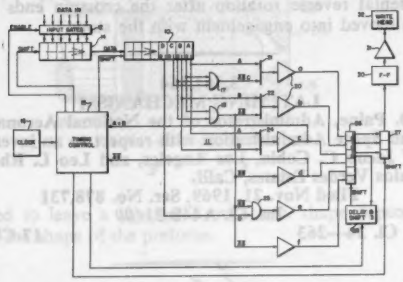


Each of *n* groups of pin electrodes comprises *m* pin electrodes for printing *n* columns in a line, each column including *m* pin electrodes. *m* pin driving circuits are connected to and drive the pin electrodes and *n* column driving circuits are connected to and drive the pin electrodes with a signal of opposite polarity. Each of a pluarity of clamping circuits clamps a corresponding one of the pin electrodes to a potential between it and a potential plate lower than a no-printing threshold level. The pin electrodes are selectively driven by signals supplied by only one of the pin driving and column driving circuits to print an electrostatic image on a record medium interposed between the pin electrodes and the potential plate. The signals have a polarity which is not clamped by the clamping circuits.

3,564,557
SELF-CLOCKING RECORDING
Leonard B. Ruthazer, Norwood, Mass., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware
Filed May 21, 1968, Ser. No. 730,756
Int. Cl. G08c *9/04;* **G11b** *5/02, 27/28*
U.S. Cl. 346—74 **22 Claims**

A serial coding arrangement for binary information is described following the requirement that at least every other bit position contains a signal transition. To achieve

this, a coding scheme is used in which three of the possible configurations of two binary bits of information are encoded as three unique three bit configurations and the fourth two bit configuration is encoded along with the



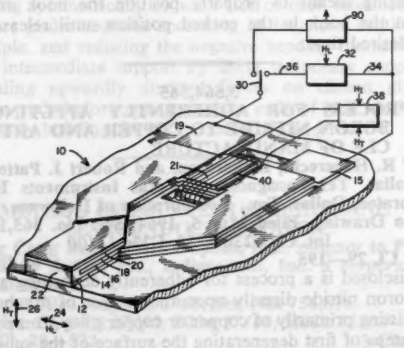
following two bits of binary input information in one of four unique six bit configurations. This could be described as variable length coding and implementation arrangements for both the encoding and decoding are disclosed.

3,564,558

HIGH-DENSITY MAGNETIC RECORDING SCHEME

Charles H. Tolman, Bloomington, and Paul E. Oberg and Maynard C. Paul, Minneapolis, Minn., assignors to Sperry Rand Corporation, New York, N.Y., a corporation of Delaware

Filed Aug. 26, 1968, Ser. No. 755,186
Int. Cl. G11b *5/16, 5/02, 5/30*
U.S. Cl. 346—74 **20 Claims**



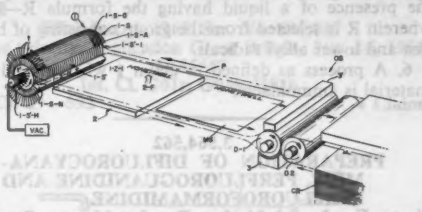
A method of high-density magnetic recording using a magnetic recording head having a recording gap that is inductively coupled to a relatively moving or stationary thin-ferromagnetic-film recording medium of a thickness that is insufficient to support Bloch walls, i.e., can only support Néel walls, between adjacent domains and having an easy axis that is orthogonal to the direction of relative movement or parallel to the recording gap. The recording medium's interdomain Néel walls are formed with the magnetization within the walls having the same directional rotational, i.e., winding, sense, e.g., clockwise or counterclockwise, by applying first or second and opposite polarity orthogonal fields H_L and H_T in the recording gap.

3,564,559

ELECTROSTATIC RECORDER WITH ELECTRODES ARRANGED INSIDE OF A HOLLOW TYPE ROLL

Earl E. Masterson, Newtonville, David W. Bernard, Sherborn, and Michael J. Shebanow, Medfield, Mass., assignors to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware

Filed Nov. 1, 1967, Ser. No. 679,891
Int. Cl. G01d *15/06;* **B41f** *17/00*
U.S. Cl. 346—74 **21 Claims**



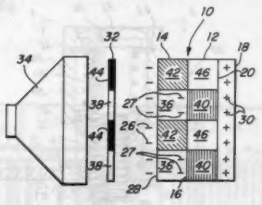
A high speed electrostatic printing mechanism including a hollow type roll presenting a concave matrix of raised-font electrodes configured as different alpha-numeric print-characters. In one embodiment rows of character-font are presented, each along a respective conductive strip, these strips being electrically-independent and surrounding an inner rotating drive roll provided to advance dielectric recording media past the strip matrix to be selectively charge-imaged. The electrostatic transfer-potential applied across selected "print-areas" of the dielectric can be arranged to (electrostatically) image, either "line-by-line" (driving a record repeatedly past the matrix, one pass for each line), or "by-the-page" (provided sufficient memory storage and fast-switching means are available). The dielectric is thereafter developed and copied at a toner/transfer station.

3,564,560

RECORDING IN AN ELECTRO-OPTIC MEDIUM

Ralph Edward Aldrich, Arlington, and Paul John Caruso, Bedford, Mass., assignors to Itek Corporation, Lexington, Mass., a corporation of Delaware

Filed June 27, 1968, Ser. No. 740,709
Int. Cl. G01d *15/06;* **G11c** *11/42*
U.S. Cl. 346—74 **12 Claims**



A method and apparatus are disclosed for storing information supplied in the form of a radiation pattern by establishing an electro-static charge distribution across an electro-optic medium and a photoconductor medium to create, across the electro-optic medium, an electric field which varies as a function of radiation applied to the photoconductor medium, and results in corresponding variations in an electro-optic characteristic of the electro-optic medium.

ERRATA

For All Classes Out see:
Patent Nos. 3,564,561 thru 3,564,608

3,564,561

TRIBOROHYDRIDE-8 SALT PREPARATION

Dorothy Ann Livingston Carvalho, Bridgeport, Conn., and Nestor W. Shust, Silver Spring, Md., assignors to American Cyanamid Company, Stamford, Conn., a corporation of Maine

No Drawing. Filed Nov. 16, 1962, Ser. No. 343,173
Int. Cl. C01b 6/20, 6/22
U.S. Cl. 23—358 18 Claims

1. A process for producing triborohydride-8 salts comprising reacting pentaborane-9 with a basic material in the presence of a liquid having the formula R—O—H wherein R is selected from the group consisting of hydrogen and lower alkyl radicals.

6. A process as defined in claim 1 wherein said basic material is ammoniacal.

3,564,562

PREPARATION OF DIFLUOROCYANAMIDE, PERFLUOROGUANIDINE AND PERFLUOROFORMAMIDINE

Simon Frank and Marion Douglas Meyers, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn., a corporation of Maine

No Drawing. Filed May 11, 1962, Ser. No. 195,023
Int. Cl. C01c 3/16
U.S. Cl. 23—359 11 Claims

1. The method of preparing fluorinated compounds which comprises contacting finely divided biguanide with gaseous fluorine admixed with an inert carrier gas; and collecting the reaction products including 1,1-difluorocyanamide.

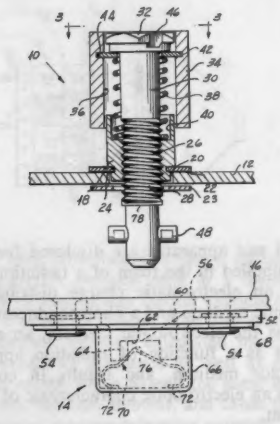
6. The method of preparing fluorinated compounds which comprises contacting a fluid bed comprising finely divided biguanide with a mixture of gaseous fluorine and an inert carrier gas, said fluid bed being at a temperature within the range of from −15° C. to +120° C.; collecting the products of the reaction; and isolating, as separate components, perfluoroformamidine, perfluoroguanidine and 1,1-difluorocyanamide from the reaction products.

3,564,563

ADJUSTABLE QUICK ACTING FASTENER

Walter Trotter, Fair Lawn, Paul R. Gley, Hillsdale, and Werner Dellith, Ringwood, N.J., assignors to Rex Chainbelt Inc., Milwaukee, Wis., a corporation of Wisconsin

Filed Jan. 9, 1968, Ser. No. 696,545
Int. Cl. A44b 17/00
U.S. Cl. 24—221 7 Claims



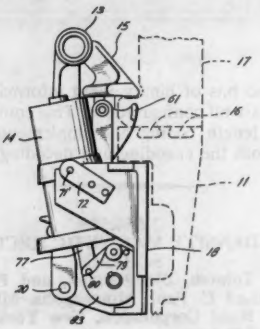
An adjustable quick acting fastener in which a crosspin stud releasably locked in an axially adjusted position on a nut carried by one of two members to be fastened carries a crosspin, the ends of which are adapted to ride up cam surfaces and onto level surfaces against stops, all provided by a receptacle carried by the other member, in response to rotation of the stud and nut assembly. A spring held in operative relationship with the receptacle by a cover has locking detents which snap behind the ends of the crosspin to hold the stud and nut assembly against accidental reverse rotation after the crosspin ends have been moved into engagement with the stops.

3,564,564

LATCHING MECHANISM

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of Jacob C. Cobin, Los Angeles, and Leo L. Rhodes, Palos Verdes Estates, Calif.

Filed Nov. 21, 1969, Ser. No. 878,731
Int. Cl. A44b 21/00
U.S. Cl. 24—263 17 Claims



A latch for latching docking rings on a space vehicle, for example. It includes a latching hook connected to a stored energy power package, such as a spring, and a cocking handle which simultaneously unlatches the hook and stores energy in the power package. It also includes triggering means to properly position the hook and to retain the hook in the cocked position until released at the desired time.

3,564,565

PROCESS FOR ADHERENTLY APPLYING BORON NITRIDE TO COPPER AND ARTICLE OF MANUFACTURE

Rolf R. Haberecht, Richardson, and Robert J. Patterson, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex., a corporation of Delaware

No Drawing. Filed May 5, 1964, Ser. No. 365,153
Int. Cl. C23b 5/52; C23c 11/00
U.S. Cl. 29—195 62 Claims

Disclosed is a process for adherently depositing a film of boron nitride directly upon the surface of a substrate consisting primarily of copper or copper alloy, comprising the steps of first degenerating the surface of the substrate by the interspersion of foreign atoms into the lattice structure of the copper, and then depositing a film of boron nitride on the degenerated surface.

3,564,566

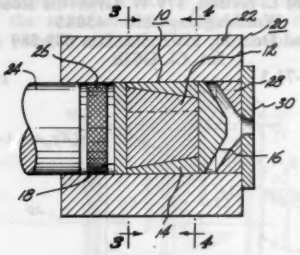
PROCESS AND FABRICATION OF TAPERED TITANIUM AND/OR OTHER ALLOY EXTRUSIONS

George H. Heitman, Shrewsbury, Mass., assignor to The Boeing Company, Seattle, Wash., a corporation of Delaware

Filed Nov. 26, 1968, Ser. No. 779,047
Int. Cl. B23p 17/00
U.S. Cl. 29—423 2 Claims

A preformed longitudinally tapered structural shape such as a T section, a Z section, a round bar, etc., is en-

cased in the core of a dissimilar material. The encasement is extruded, after which the encasing material is removed to leave a tapered T or Z, etc. shape dependent upon the shape of the preform.

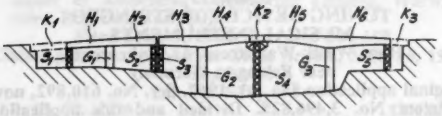


3,564,567

BUILDING METHOD FOR MULTISPANS STRUCTURES

Viliman Mladyenovitch, Neuilly-sur-Seine, France, assignor of one-half to Coyne & Bellier, Bureau d'Ingenieurs Conseils, Paris, France, a company of France

Filed Jan. 15, 1968, Ser. No. 690,775
Claims priority, application France, Jan. 19, 1967, 91,774
Int. Cl. B23p 19/00
U.S. Cl. 29—429 4 Claims



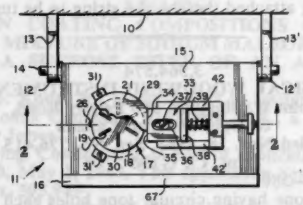
A method of building a continuous girder lying on intermediate supports and two end supports, which consists in building symmetrically on each side of each intermediate support girder sections according to balanced cantilever principle, and reducing the negative bending moment on each intermediate support by using temporary supports providing upwardly directed forces on chosen girder section ends before connecting the ends of said sections, and lastly building the end sections of the girder.

3,564,568

METHOD OF LOCATING AND HOLDING SEMICONDUCTOR WAFER

Victor Craig Bunner, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind. a corporation of Delaware

Filed Aug. 22, 1968, Ser. No. 754,676
Int. Cl. B01j 17/00; B23q 17/00; H05k 13/04
U.S. Cl. 29—572 3 Claims



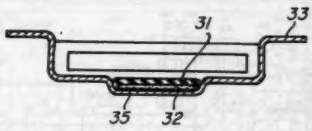
A method for locating and holding a semiconductor wafer with respect to an image of geometrical patterns of a master array through the use of suction to hold said wafer on a support means. The wafer is positioned by engaging and disengaging the edge of the wafer and the wafer is axially aligned by displacing said support means.

3,564,569

METHOD OF MAKING VOLTAGE REGULATORS

Roger William Nolan, Redditch, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 4, 1968, Ser. No. 695,787
Claims priority, application Great Britain, Jan. 16, 1967, 2,185/67
Int. Cl. G01r; G05f; H01b
U.S. Cl. 29—593 4 Claims



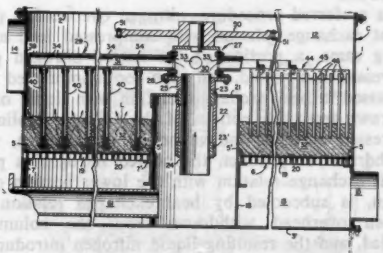
A voltage regulator for a battery charging system on a road vehicle is manufactured by mounting the active components of the regulator on a thick film printed circuit including a setting resistor exposed on one edge of the substrate of the printed circuit. Any remaining connections are then made, and if the regulator is satisfactory the resistor exposed on the edge of the substrate is abraded to set the oscillating voltage of the regulator, the regulator then being mounted on a heat sink and encapsulated. As an essential feature, the regulator is tested before the abrading operation, so that if it is faulty the thick film circuit can be used again by removing the active components from it.

3,564,570

GAS-SOLIDS SEPARATOR

Roland L. Lincoln, Macungie, Frank G. Miller Jr., Bethlehem, and Walter C. Gothe, Macungie, Pa., assignors to Fuller Company, a corporation of Delaware

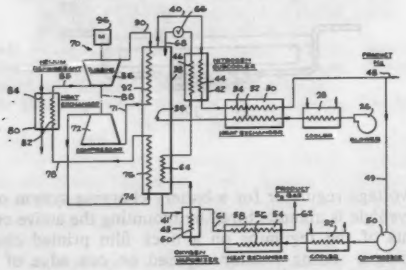
Filed Mar. 8, 1968, Ser. No. 711,652
Int. Cl. B01d 46/36
U.S. Cl. 55—286 14 Claims



A dust collecting and filter cleaning apparatus having a filter media consisting of a bed of granular material for removing dust from dust laden gases passing therethrough. When the bed becomes loaded with dust deposits, the flow of dust laden gas is interrupted and a reverse flow of clean gas is passed up through the entire bed area for fluidizing

the granular bed and simultaneously compressed air pipes are moved through the granular bed to produce rapid agitation of localized areas of the bed to liberate the deposited dust particles which are conveyed out of the apparatus with the reverse clean gas flow.

3,564,571
SEPARATION OF AIR UTILIZING A CLOSED-CYCLE HELIUM REFRIGERATION SYSTEM
James D. Yearout, Rolling Hills, Calif., assignor, by mesne assignments to McDonnell Douglas Corporation, Santa Monica, Calif., a corporation of Maryland
Continuation of application Ser. No. 539,840, Apr. 4, 1966. This application May 26, 1969, Ser. No. 828,806
Int. Cl. F25j *1/02, 3/04, 3/02*
U.S. Cl. 62—40 **12 Claims**

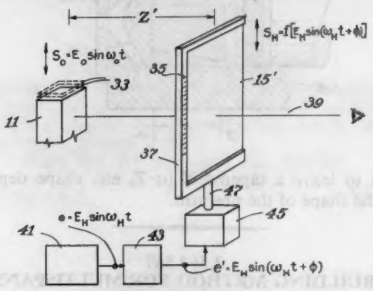


In the separation of oxygen and nitrogen from air, the process involving introducing compressed cooled air at its saturation temperature into a fractionating column, passing another gaseous medium such as helium into heat exchange relation along the lower portion of the fractionating column, the helium being at a temperature to supply heat along the lower portion of the column, cooling the resulting heated helium, preferably by heat exchange with an external refrigerant followed by work expansion of the helium, passing the cooled helium gas into heat exchange relation along the upper portion of the column, such helium being at a temperature to remove heat along the upper portion of the column, compressing the exiting helium and recycling same in heat exchange relation along the lower portion of the column, thus effecting a differential distillation of the air in the column, and separating nitrogen overhead from the upper end of the column and liquid oxygen from the lower end of the column.

In a preferred procedure, nitrogen overhead is passed in heat exchange relation with compressed feed air for cooling same, a portion of the heated nitrogen gas is compressed and cooled, and such cool compressed nitrogen passed in heat exchange relation with liquid oxygen withdrawn from the bottom of the column, cooling the compressed nitrogen and vaporizing the oxygen, which is withdrawn as product, the cooled nitrogen is passed in heat exchange relation with the lower portion of the column, is subcooled by heat exchange relation with nitrogen overhead withdrawn from the column, is throttled, and the resulting liquid nitrogen introduced as reflux to the top of the column.

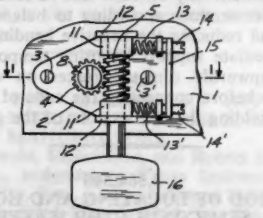
The system has the advantage of employing a single fractionating column operating at or slightly above atmospheric pressure, with reduced power consumption and increased efficiency, the only gas requiring significant compression being the portion of the gaseous nitrogen withdrawn from the upper end of the column and recycled to provide additional reflux to the column.

3,564,572
METHOD AND APPARATUS FOR MEASURING THE FREQUENCY OF VIBRATION OF AN OBJECT USING HOLOGRAMS
Richard L. Nelson, 179 W. Granville Road, Worthington, Ohio 43085
Filed Dec. 11, 1967, Ser. No. 689,589
Int. Cl. G01h
U.S. Cl. 73—71.3 **10 Claims**



Measuring the amplitude and frequency of vibration of a solid object wherein a hologram is made of the object under investigation and an image of this object is reconstructed and vibrated for use in comparing its controlled vibration with that of the object.

3,564,573
TUNING DEVICE FOR STRINGED MUSICAL INSTRUMENTS
Hans Wüstl, Waldstrasse 41, Bubenreuth, near Erlangen, Germany
Original application Jan. 23, 1967, Ser. No. 610,892, now Patent No. 3,496,825. Divided and this application Aug. 7, 1969, Ser. No. 848,164
Int. Cl. G01d *3/14*
U.S. Cl. 84—306 **13 Claims**

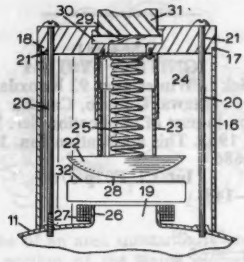


A tuning device for a stringed musical instrument in which a selected one of the strings of the instrument can be gradually and accurately tuned by continuously biasing a spindle into rotation-transmitting play-free engagement with a worm gear which in turn is secured to a rotary shaft having attached thereon the string to be tuned.

3,564,574
MUSICAL WOODWIND INSTRUMENT
John W. Singular, 566 Paisley Road, Guelph, Ontario, Canada
Filed Nov. 18, 1968, Ser. No. 776,415
Int. Cl. G10d *7/06*
U.S. Cl. 84—380 **2 Claims**

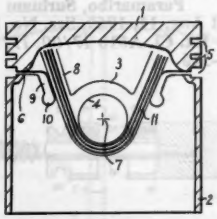
A saxophone having circular tone holes each of which is provided with an electro-magnetically operable valve for selectively covering and uncovering the tone hole, so that the weight and manufacturing costs of the saxophone

may be reduced, and the tone holes may be positioned at the locations for optimum pitch quality without awkward fingering of the instrument being required. The valve member of each valve has a face of part-spherical form which contacts the associated tone hole when the tone hole is in the covered condition, the dimensions of said face



being greater, in a plane parallel to the plane of the tone hole, than the diameter of the tone hole. Each valve includes a casing which co-axially surrounds the associated tone hole and which is formed with two diametrically opposed openings the lower edges of which are in the plane of the tone hole.

3,564,575
PISTONS
John Anthony Catherall, Leamington Spa, England, assignor to Associated Engineering Limited, Warwickshire, England, a company
Filed Mar. 5, 1969, Ser. No. 804,459
Claims priority, application Great Britain, Mar. 15, 1968, 12,834/68
Int. Cl. F16j *1/04*
U.S. Cl. 92—230 **14 Claims**

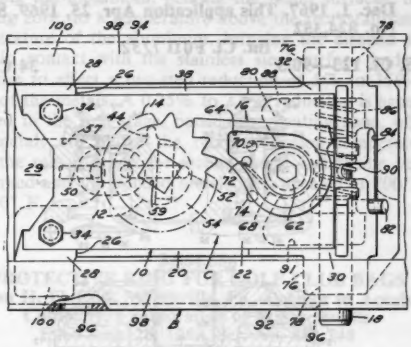


The present invention relates to pistons and to methods for their manufacture. According to the invention a piston includes filamentary reinforcement provided at least in the region of the or each gudgeon pin bore. The filamentary reinforcement may extend from the region of or adjacent to the piston crown to the region of the or each gudgeon pin bore.

3,564,576
GELATIN COATING COMPOSITIONS CONTAINING A MIXTURE OF SODIUM MALEOPIMARATE AND A SUCROSE ESTER OF AN ALIPHATIC ACID
William J. Knox, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y., a corporation of New Jersey
No Drawing. Continuation-in-part of application Ser. No. 365,180, May 5, 1964. This application Sept. 11, 1964, Ser. No. 395,949
Int. Cl. G03c *1/38*
U.S. Cl. 96—114.5 **11 Claims**

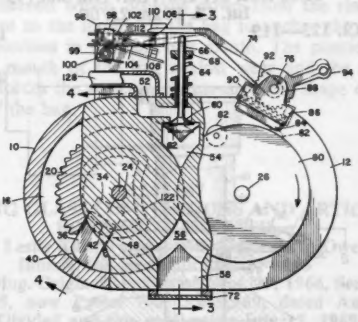
Coating processes and compositions of matter coated thereby comprising gelatin and containing therein, as a coating aid, a mixture of sodium maleopimarate and a sucrose ester of an aliphatic acid are disclosed. Said processes and coating compositions find particularly good usage in photographic layers, emulsions and elements.

3,564,577
VEHICLE TIE-DOWN STRUCTURE
Donald J. Blunden, Southfield, and Allan C. Kack, Detroit, Mich., assignors to Whitehead & Kales Company, River Rouge, Mich., a corporation of Michigan
Filed Aug. 19, 1969, Ser. No. 851,209
Int. Cl. B61d *45/00*; B60p *7/08*
U.S. Cl. 105—369 **4 Claims**



A vehicle tie-down structure comprising a longitudinally extend rail adapted to be anchored lengthwise upon a longitudinally extending deck of a transport, and a carriage movable lengthwise of the rail. The carriage has a rotatable shaft upon which is wound a flexible element adapted to engage and hold a vehicle. A ratchet gear and pawl are provided for preventing rotation of the shaft in one direction, and a lock pin is provided for securing the carriage to the rail in longitudinally adjusted position.

3,564,578
ROTARY ENGINE
John H. Taylor, 2033 Wilbur St., San Diego, Calif. 92109
Continuation-in-part of application Ser. No. 820,174, Apr. 29, 1969. This application Dec. 31, 1969, Ser. No. 889,543
Int. Cl. F02b *53/06*
U.S. Cl. 123—8.49 **8 Claims**



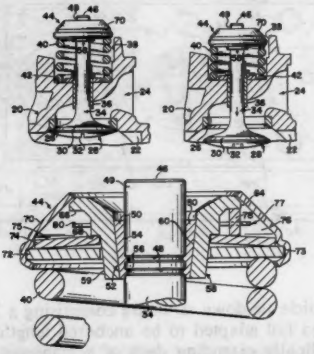
A rotary engine having a pair of inter-engaging rotors, each with a cam guided slide element which rides in an annular cylinder chamber. Ignition timing means is combined with variable valve actuating mechanism and the

engine is adaptable to gaseous fuels with oxidizer, or conventional liquid fuel and air mixtures, admitted under pressure, combustion being very complete with minimum noxious exhaust emission. Basic elements of the engine are designed to allow axial stacking of multiple units on common rotor shafts.

3,564,579
VALVE ROTATING DEVICE

George B. K. Meacham, Birmingham, and Vernon A. Johnson, Southfield, Mich., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio, a corporation of Ohio

Continuation-in-part of application Ser. No. 687,288, Dec. 1, 1967. This application Apr. 25, 1969, Ser. No. 824,352
Int. Cl. F01l *1/32*
U.S. Cl. 123—90.3 **34 Claims**

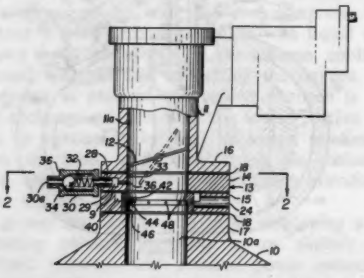


A rotating device for poppet-type valves including a spring washer and a plurality of sprags positioned between first and second parts, one of said parts being interconnected for rotation with the valve. Deflection of the spring washer on the valve open stroke causes the sprags to pivot from a first to a second position relative to the spring washer, producing rocking movement of the sprags and rotation of the valve. The sprags are mounted on a resilient device which encircles the valve stem and normally but yieldably holds the sprags in said first position.

3,564,580
ANTI-POLLUTION DEVICE

Alphonse Cinque, Lynbrook, N.Y., assignor to Dorado Research Corporation, Lynbrook, N.Y., a corporation of New York

Filed Dec. 29, 1969, Ser. No. 888,792
Int. Cl. F02m *23/00*
U.S. Cl. 123—119 **10 Claims**

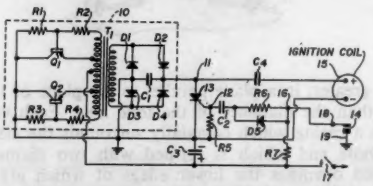


An anti-pollution device comprising a plate member is inserted between a carburetor and the intake manifold. The member has a bore which is shaped with a straight section, a convergent section and a divergent section. Supplemental air is permitted to enter the divergent section by means of holes in a plenum chamber (surrounding the bores) which receive the supplemental air from conduits. A larger quantity of air is automatically controlled by a valve to enter the bores through the straight section during engine deceleration.

3,564,581
IGNITION SYSTEM

Frederick L. Winterburn, 92 Knoxdale Road, Ottawa, Ontario, Canada

Continuation-in-part of application Ser. No. 310,550, Sept. 23, 1963. This application Jan. 11, 1965, Ser. No. 425,686
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 **13 Claims**

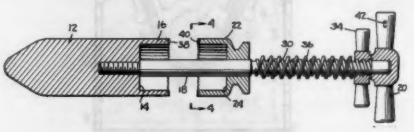


A capacitor discharge type of ignition system is provided with an electronic switch triggered from the breaker points through a capacitor and diode. The capacitor discharges through a resistor in parallel with the diode on point closing to provide a time constant delay to eliminate the effect of point bounce.

3,564,582
OBTURO-MUCO-RETRACTOR

Richenel J. Tjong-Joe-Wai, Cornelis Jong Baw Straat 16, Paramaribo, Surinam

Filed Aug. 11, 1969, Ser. No. 849,004
Int. Cl. A61b *17/00, 17/11*
U.S. Cl. 128—346 **7 Claims**



An instrument for proctological operations comprising a cylinder with tapered tip and concave base secured to a handled shaft disposed axially through the base, a concave closure member slidably mounted on the shaft with its concavity facing the cylinder cavity, a wing nut threaded on the shaft between the closure member and the handle, and a coil spring disposed around the shaft between the wing nut and the closure member, with the latter adapted to be urged against the cylinder by rotation of the wing nut.

3,564,583
ELEVATED WIG

Raphael Klugmann, New York, N.Y., assignor to Alfred Klugmann, Inc., New York, N.Y.

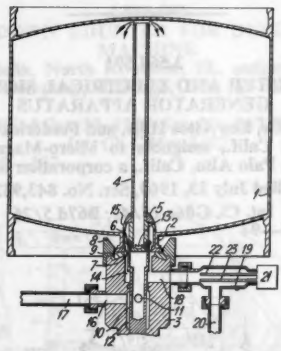
Filed Jan. 6, 1970, Ser. No. 853
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **2 Claims**

A wig including a foundation element of relatively inextensible material and having inner and outer surfaces. Hair is attached to the outer surface to cover substantially the entire foundation element. A lining element composed of the relatively resiliently expandable textile material of size and shape generally corresponding to that

of the foundation element is interconnected to the inner surface of the foundation element over a substantial area thereof, leaving a generally centrally disposed area which is free of interconnection, such that when the lining element is in relatively unstressed condition, the portion of the foundation element which is free of interconnection

therewith will be of an area substantially greater than the corresponding portion of the lining element. When the wig is worn, the lining element is placed in contact with the head of the wearer, the unconnected corresponding area of the foundation element being thereby bowed upwardly to give an impression of greater height to the wearer.

3,564,584
MACHINES FOR WASHING BEER KEGS AND LIKE CONTAINERS
Maurice Ruddick, Rochester, Kent, England, assignor to Burnett & Rolfe Limited, Rochester, England, a British company
Filed Aug. 12, 1968, Ser. No. 751,858
Claims priority, application Great Britain, Aug. 18, 1967, 38,125/67
The portion of the term of the patent subsequent to July 8, 1985, has been disclaimed
Int. Cl. B08b *3/10, 9/14*
U.S. Cl. 134—57 **3 Claims**

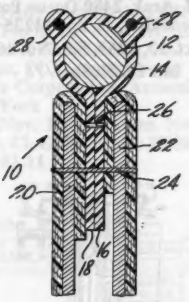


A machine for automatically washing beer kegs or like containers comprises a head which is arranged to be applied to the bung hole or other opening of the container and which has an inlet passage for the supply of washing liquid to the container and for the supply of steam or gas under pressure and an outlet passage out of which liquid supplied to the container is blown by the steam or gas, the supply of liquid and gas or steam and other operations of the machine being controlled by a control device. The control device is connected to a liquid detector which is in communication with the outlet passage, such that after the supply of washing liquid and the subsequent supply of gas or stream, the detector causes the control device to initiate a further operation of the machine only when the detector detects the absence of washing liquid in the outlet passage. The detector is an electrical device which is sensitive to the electrical conductivity of the fluid flowing through the outlet passage, the conductivity of liquid being greater than the conductivity of steam or gas.

3,564,585
METHOD FOR MAKING STAINLESS STEEL CLAD ALUMINUM
William C. Camp, McMurray, Pa., assignor to Composite Metal Products, Inc., a corporation of Pennsylvania
No Drawing. Filed Aug. 19, 1968, Ser. No. 753,750
Int. Cl. B23p *3/02;* **C22f** *1/04*
U.S. Cl. 148—11.5 **16 Claims**

Aluminum is clad with stainless steel by mechanically cleaning the aluminum, heating the metal surfaces, in a heating zone, to a temperature above the recrystallization temperature of the aluminum, bringing the cleaned surface in contact with the stainless steel surface under a pressure to effect a two-step reduction of 5% to 35% in each of the metals. A 0.25% to 2.0% reduction is accomplished in the first stage, outside the heating zone, while the metals are above the recrystallization temperature with the remainder in the second stage. A diffusion bond is formed and the bonded metals are annealed at 700° F. to 900° F.

3,564,586
PROTECTIVE RING FOR GOLF CLUB BAGS
Loman H. Le Goff, Morrisville, Pa., assignor to Acushnet Company, a corporation of Massachusetts
Filed Aug. 28, 1969, Ser. No. 853,740
Int. Cl. A63b *55/00*
U.S. Cl. 150—1.5 **10 Claims**



A metal annular ring to be attached to the mouth of a golf bag is surrounded by plastic. The plastic has an extension thereon which projects down from the ring for attachment to the mouth of the bag to anchor the metal ring in position in the golf bag mouth. The plastic protects the mouth of the bag against wear and the metal ring reinforces the structure to preserve the shape of the mouth of the bag.

3,564,587
SEALING GLASS COMPOSITIONS AND ARTICLES BONDED THEREWITH
James Leslie Ellis, Toledo, Ohio, assignor to Owens-Illinois, Inc., a corporation of Ohio
No Drawing. Original application Sept. 29, 1966, Ser. No. 583,105, now Patent No. 3,459,569, dated Aug. 5, 1969. Divided and this application July 15, 1969, Ser. No. 842,004
Int. Cl. B22b *17/06*
U.S. Cl. 161—193 **9 Claims**

A composite article comprising two glass or glass-ceramic surfaces bonded together by an intermediate layer

of bonding glass consisting essentially of 10–22 mole percent Li_2O, 5–12 mole percent Cu_2O, 0–3 mole percent Fe_2O_3, 0–2.5 mole percent MnO_2, 6–10 mole percent Al_2O_3 and 55–70 mole percent SiO_2.

3,564,588

CHEMILUMINESCENT SYSTEM FOR DETECTING LIVING MICROORGANISMS

Giorgio Soli, Los Angeles, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 7, 1964, Ser. No. 380,958
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 **6 Claims**

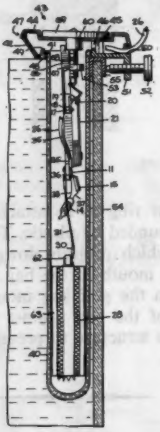
A method for detecting living microorganisms in abnormal concentrations and differentiating them from inert matter by taking advantage of the ability of microorganisms to decompose hydrogen peroxide through the enzyme, catalase, which they generate. Therefore, by providing a system containing hydrogen peroxide and a chemiluminescent compound the enzyme decomposes the peroxide thereby activating the chemiluminescent compound which produces a light change and reveals the presence of living microorganisms.

3,564,589

IMMERSION-TYPE AQUARIUM HEATER WITH AUTOMATIC TEMPERATURE CONTROL AND MALFUNCTION SHUT-OFF

Henry M. Arak, 2480 Ocean Parkway, Brooklyn, N.Y. 11235

Filed Oct. 13, 1969, Ser. No. 865,621
Int. Cl. H05h *3/78*
U.S. Cl. 219—331 **5 Claims**



An immersion-type electric aquarium heater consisting of a housing, securable to an aquarium wall, in combination with an open-necked tube opening into and suspended from the housing, with a heating element and a mounting-supported temperature-responsive switch unit disposed within the tube and electrically connected in a circuit to an electric plug, with the contact points of the switch unit members manually adjustable with respect to each other, and a capacitor electrically connected across the lines of the electric plug in a circuit parallel to the circuit of the heating element.

3,564,590

GARMENT CARRIER

John A. Hebel, 249 Churchill Lane, Ballwin, Mo. 63011

Filed Sept. 30, 1969, Ser. No. 862,183
Int. Cl. A45f *3/02*
U.S. Cl. 224—5 **12 Claims**

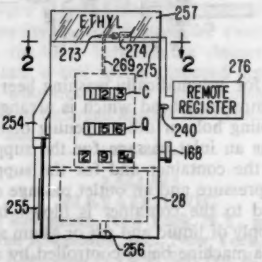
A garment carrier for hanger-held clothing includes a carrier strap adapted to fit over the user's shoulder. At its rear end the strap is connected in a garment bag, while at its forward end the strap is provided with a hook which can be easily gripped or engaged with the handle of a small valise to counteract the weight of the clothing. A shoulder pad is interposed between the user's shoulder and the strap to distribute the weight of the clothing across the user's shoulder.

3,564,591

REGISTER AND ELECTRICAL SIGNAL GENERATOR APPARATUS

John B. Riddle, Los Altos Hills, and Frederick K. Tanaka, Hayward, Calif., assignors to Micro-Magnetic Industries, Inc., Palo Alto, Calif., a corporation of California

Filed July 23, 1969, Ser. No. 843,952
Int. Cl. G06c *15/42*; B67d *5/26*
U.S. Cl. 235—94 **10 Claims**



An electrical signal generator coupled to a mechanical register apparatus of a gasoline pump is disclosed. A set of number wheels for registering the cost of the gasoline is coupled to a driven gear train for rotating the number wheels during a counting operation and is decoupled from

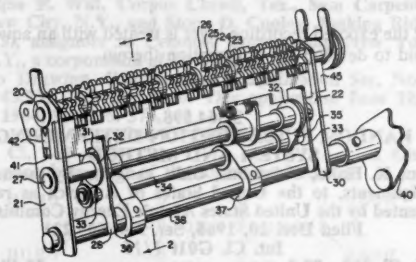
the driven gear train and coupled to a reset gear train for resetting the number wheels to zero during a reset operation. The signal generator comprises a rotatable shaft and a first gear means coupled to the driven gear train for rotating the main drive shaft during the counting operation. A second gear means coupled to the reset gear train rotates the shaft to a home position during the resetting operation.

3,564,592

TOTALIZER ALINER MECHANISM

George J. Eberhardt, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio, a corporation of Maryland

Filed Jan. 15, 1969, Ser. No. 791,329
Int. Cl. G06c *25/00, 29/00*
U.S. Cl. 235—130 4 Claims



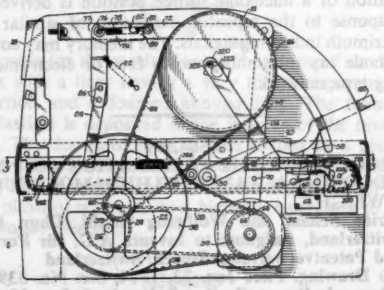
An aliner mechanism for selectively releasing a totalizer element for operation while disabling the remaining totalizer elements. The aliner mechanism includes a notched member which is slidably mounted for movement between several positions, each position selecting only one totalizer element for operation, the totalizers including an add-subtract totalizer element.

3,564,593

COUNTDOWN COUNTER FOR DUPLICATING MACHINE

Paul G. Bielik, North Riverside, Ill., assignor to Bell & Howell Company, Chicago, Ill., a corporation of Illinois

Filed Oct. 20, 1969, Ser. No. 867,520
Int. Cl. G06m *3/02*
U.S. Cl. 235—132 5 Claims



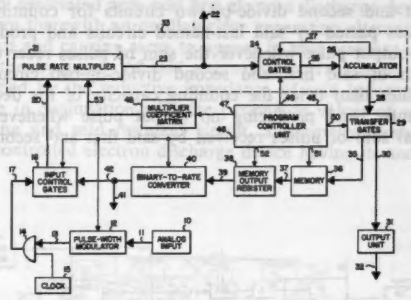
This invention is directed to countdown counting apparatus for use with duplicating machines including a copy selector movable along a straight line path rather than a rotary path, which may be pre-set to duplicate any desired number of copies. Operationally, the copy selector is automatically indexed one unit in the direction of its home position during each duplicating cycle of the machine. Operation of duplicating machine is automatically terminated upon the selector attaining the home position.

3,564,594

PULSE RATE COMPUTER INCLUDING STORAGE REGISTERS FOR FEEDING BACK PARTIAL RESULTS OF COMPUTATIONS

Vincent Montalto, Jr., Fridley, Anoka, Minn., assignor to Honeywell Inc., Minneapolis, Minn., a corporation of Delaware

Filed Aug. 5, 1965, Ser. No. 477,370
Int. Cl. G06j *1/00*
U.S. Cl. 235—150.3 14 Claims



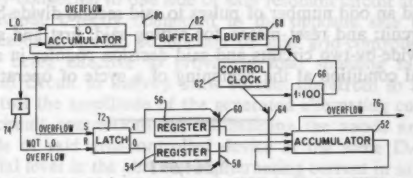
A pulse rate computer including storage registers arranged in a feedback configuration for feeding back partial results of computations is shown and described.

3,564,595

DATA INTERPOLATION FOR COMPUTER CONTROL OF MACHINE TOOLS

Albert R. De Florio, Philadelphia, Pa., and Donald Wortzman, Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., a corporation of New York

Filed Nov. 19, 1968, Ser. No. 776,948
Int. Cl. G08c *19/20;* H03k *3/78*
U.S. Cl. 235—151.11 7 Claims



A system for interpolating data so as to generate a stream of pulses for controlling a machine tool or other precise mechanism. The interpolation is broken into a high-speed portion and a low-speed portion. The low-speed portion is performed by a general purpose computer and the high-speed portion is performed by a special purpose interpolator.

3,564,596

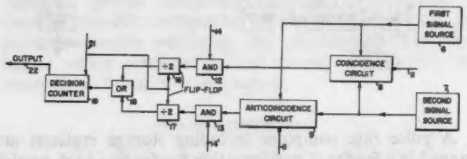
DECISION COUNTER

Cabell N. Pryor, Jr., Silver Spring, Md., assignor to the United States of America as represented by the Secretary of the Navy

Filed June 29, 1962, Ser. No. 206,529
Int. Cl. G06f *15/34*
U.S. Cl. 235—181 6 Claims

3. A logical decision circuit comprising a first and a second AND gate each having an input for receiving

pulses, an output terminal and an enabling means for passing the input pulses to the output terminal during a first and a second period of time respectively; a first and a second resettable divide-by-two circuit each having an input terminal connected to a different one of the said first and second AND gates for receiving the passed pulses, an output terminal for passing every second received pulse, and a reset terminal for setting the first and second divide-by-two circuits in an initial condition for passing every second pulse received; a multi-stage resettable decision counter means connected to both of said first and second divide-by-two circuits for counting all pulses passed by said last-named circuits and producing an output pulse whenever the sum of pulses received by both of said first and second divide-by-two circuits is greater than twice the counting capacity of the decision counter, and producing no output pulse whenever the total sum of pulses received by said first and second divide-by-two circuits is less than twice the counting capacity of decision counter, and producing an output pulse whenever the sum of pulses received by said first and second divide-by-two circuits is equal to twice the counting capacity of the counter means and obtained by summing an even number of pulses to said first divide-by-two circuit and an even number of pulses to said second divide by-two circuit, and producing no output pulse whenever the sum of pulses received by said first and second divide-by-two circuits is equal to twice the counting capacity of the counter means and obtained by summing an odd number of pulses to said first divide-by-two circuit and an odd number of pulses to said second divide-by-two circuit; and reset means for setting said, first and second divide-by-two circuits and said decision counter in an initial condition at the beginning of a cycle of operation.



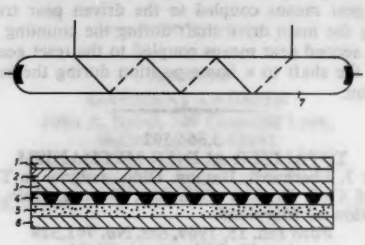
3,564,597

THERMOGRAPHIC RECORDING PROCESS FOR REPRODUCING CONTINUOUS TONE TRANSPARENCIES

Marcel Nicolas Vrancken, Hove, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium, a Belgian company

Filed Jan. 11, 1967, Ser. No. 608,572
Claims priority, application Great Britain, Jan. 11, 1966, 1,351/66
The portion of the term of the patent subsequent to Nov. 4, 1986, has been disclaimed
Int. Cl. G03b *41/00*
U.S. Cl. 250—65 12 Claims

A process of reproducing information wherein a heat-sensitive recording layer adapted to change the water-permeability thereof when heated and containing uniformly distributed therethrough finely-divided material absorbing visible radiation and converting the same to heat is exposed to radiation through a continuous tone transparency to be reproduced and a screen, the time of the exposure being not more than one-tenth of a second, and the intensity of the radiation being sufficient to produce in the exposed portions of the recording layer sufficient heat to bring about the change in its water-permeability, and the exposed recording layer is treated with an aqueous liquid to develop the information therein.

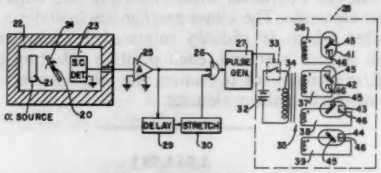


3,564,598

RANDOM PULSE POSITION DETERMINING SYSTEM AND METHOD

Linus K. Hahn, Columbus, Ohio, assignor, by mesne assignments, to the United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 20, 1966, Ser. No. 603,221
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 22 Claims



A system for determining the relative positions of a plurality of nucleonic sources relative to a nucleonic detector includes a single processing channel for deriving signals indicative of the range and azimuth of the sources relative to the detector. The signals are applied to a plane position indicator having memory features such that an indication of a nucleonic source position is derived only in response to the repeated derivation of similar range and azimuth indicating signals. The memory may comprise a cathode ray tube phosphorous face or electronic computing type network.

3,564,599

PROCESS FOR THE PREPARATION OF POLY-DODECALACTAM WITH HIGH MOLECULAR WEIGHT

Siegfried Schaaf and Wolfgang Griehl, Chur, Grison, Switzerland, assignors to Inventa A.G. für Forschung und Patentverwertung, Zurich, Switzerland

No Drawing. Filed Jan. 23, 1964, Ser. No. 339,601
Claims priority, application Switzerland, Jan. 29, 1963, 1,047/63
Int. Cl. C08g *20/10*
U.S. Cl. 260—78 5 Claims

1. A process for preparing a high molecular weight polyamide capable of after-polymerization in an inert gas atmosphere at temperatures below its melting point, which comprises polymerizing ω-dodecalactam by heating under exclusion of water at temperatures above 300° C. in the presence of a phosphoric acid in the amount of 0.05–1% by weight calculated on the ω-dodecalactam.

3,564,600

3,4 - DIMETHYL - 5 - ETHYLPHENYL METHYL CARBAMATE

Jerome G. Kuderna, Jr., Modesto, Calif., and Donald D. Phillips, Metuchen, N.J., assignors to Shell Oil Company, New York, N.Y., a corporation of Delaware

No Drawing. Continuation-in-part of application Ser. No. 200,643, June 7, 1962. This application Feb. 24, 1964, Ser. No. 346,997

Int. Cl. C07c *101/12*

U.S. Cl. 260—479 1 Claim

Disclosed is 3,4-dimethyl-5-ethylphenyl methyl carbamate, useful as an insecticide.

3,564,601

OXIDATION OF TRIVALENT PHOSPHORUS ESTERS TO PENTAVALENT PHOSPHORUS ESTERS

Enrique R. Witt, Corpus Christi, Tex., Sam Carpenter, New City, N.Y., and Stone D. Cooley, Basking Ridge, N.J., assignors to Celanese Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Continuation of application Ser. No. 43,731, July 19, 1960. This application June 10, 1964, Ser. No. 374,140

Int. Cl. C07f *9/02*

U.S. Cl. 260—929 1 Claim

A phosphate ester of the following formula:

wherein R is the dipropylene ether radical, which may be used in polyurethane foam production.

3,564,602

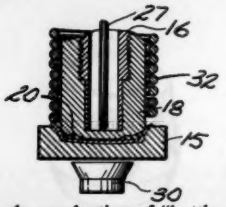
METHOD OF PREPARING CLOSURES CONTAINING A FOAMED ANNULAR SEALING LINER AND THIN CENTRAL PORTION

Robert Peck, Elmhurst, Ill., assignor to W. H. Hutchinson & Son, Inc., Chicago, Ill., a corporation of Delaware

Filed Aug. 29, 1963, Ser. No. 305,361

Int. Cl. B29d *9/06, 9/08, 27/04*

U.S. Cl. 264—45 7 Claims



A process for the production of "bottle caps" or crown closures with a liner having a very thin transparent central portion and a foamed annular ring. The foamable vinyl plastisol is deposited in the interior of the inverted closure. The deposited mass is then shaped by a plunger having a raised portion in its central portion. The shaped mass is then heated to gel the plastisol. Thereafter, the shaped plastisol is heated to a higher temperature to fuse and foam the plastisol.

3,564,603

MAGNETIC FIELD DETECTING SYSTEM

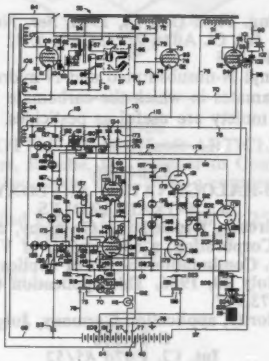
Joseph B. Tate, Jr., and Louis W. Erath, Washington, D.C., assignors to the United States of America as represented by the Secretary of the Navy

Original application Oct. 8, 1945, Ser. No. 621,155. Divided and this application Aug. 26, 1954, Ser. No. 454,646

Int. Cl. H03b *3/02*

U.S. Cl. 331—183 6 Claims

4. In a magnetic field testing system of the type employing an inductance brdige of which an unbalance therein is a measure of the deviation of the magnetic field under test from a predetermined value, the combination of an alternating current generator for supplying exciting current to said bridge and an amplitude regulator for controlling the amplitude of said exciting current, said combination comprising a first electron discharge device, an inductive winding connected in the space-discharge path of said first device and inductively coupling said bridge to transfer energy thereto, a parallel tuned resonant circuit inductively coupled to said winding, circuit means including said inductive winding and said resonant circuit operatively associated with said first electron discharge device to form therewith an oscillator for generating alternating current and causing same to appear in said resonant circuit, the frequency of said alternating current being determined by the inductive impedance of said inductance bridge in conjunction with the parametric values of said winding and said resonant circuit, a normally disabled grid-controlled electron discharge device having its anode



directly connected to one side of said resonant circuit and the cathode directly connected to the opposite side of said resonant circuit, conduction of said grid-controlled device being effective to provide a load shunting said resonant circuit to thereby draw current therefrom so as to control the amplitude of the generated alternating current, circuit connections for maintaining the anode and cathode of said grid-controlled device at the same D-C potential level in the absence of alternating current in said resonant circuit, said circuit connections enabling the presence of alternating current in said resonant circuit to establish a potential difference between said anode and said cathode, and alternating current translating means for applying the potential of the generated alternating current appearing in said resonant circuit to the control grid of said grid-controlled device for rendering said grid-controlled device conductive when the amplitude of the generated alternating current exceeds a predetermined amplitude value whereby said grid-controlled device controls the amplitude of the generated alternating current.

3,564,604

MOTION PICTURE FILM EDITOR

Gary Kaess, Fair Lawn, N.J., assignor to Atlas-Rand Corporation, Paramus, N.J., a corporation of New Jersey

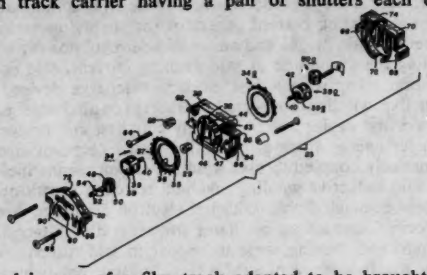
Filed Nov. 25, 1969, Ser. No. 879,795

Int. Cl. G03b *21/32*

U.S. Cl. 352—129 7 Claims

An editor and/or viewer for motion picture film is adapted to selectively accommodate two sizes of film.

The dual accommodation is provided by a removable film track carrier having a pair of shutters each disposed in way of a film track adapted to be brought in alignment with a projection path.



3,564,605

BENZOFURAN CARBAMATES AND METHOD FOR CONTROLLING ARTHROPODA NEMATODA

William G. Scharpf, Rocktown, N.J., assignor to FMC Corporation, New York, N.Y., a corporation of Delaware

No Drawing. Filed Oct. 14, 1964, Ser. No. 403,912
Int. Cl. A01n *9/28*; C07d *5/42*
U.S. Cl. 424—285 14 Claims

Benzofuranyl N-unsubstituted and N-hydrocarbon substituted carbamates in which the carbamate is located on the benzene moiety are useful as pesticides.

3,564,606

3-AMINO-5-HALOGENATED ARYLOXYMETHYL-1,2,4-OXADIAZOLES

Herman Breuer, Regensburg, Germany, assignor to Olin Corporation, a corporation of Virginia

No Drawing. Continuation-in-part of application Ser. No. 566,480, July 20, 1966. This application Oct. 9, 1967, Ser. No. 673,977
Claims priority, application Germany, July 30, 1965, C 36,548
Int. Cl. C07d *85/52*
U.S. Cl. 260—307 10 Claims

A series of 3-amino-5-halogenated aryloxymethyl-1,2,4-oxadiazoles are provided by the reaction of selected acyl carbodiimides with hydroxylamine or salts thereof to provide an intermediate N-acylsubstituted-N'-hydroxyguanidine which is converted to the substituted-1,2,4-oxadiazoles by treatment with base. The substituted-1,2,4-oxadiazoles are useful agricultural chemicals, and it has been found that they are particularly outstanding selective herbicides.

3,564,607

HALOGENATED ARYLOXYACETYL CYANAMIDES

Herman Breuer, Regensburg, Germany, assignor to Olin Corporation, a corporation of Virginia

No Drawing. Continuation-in-part of application Ser. No. 566,480, July 20, 1966. This application Oct. 9, 1967, Ser. No. 674,008
Claims priority, application Germany, July 30, 1965, C 36,548
Int. Cl. C07c *103/30*
U.S. Cl. 260—429.9 19 Claims

A series of halogenated aryloxyacetyl cyanamides has been provided. These compounds are characterized by unique biological properties, and it has been found that members of the series provided herein are outstanding herbicides.

3,564,608

SELECTED N-ACYLSUBSTITUTED-N'-HYDROXYGUANIDINES

Hermann Breuer, Regensburg, Germany, assignor to Olin Corporation, a corporation of Virginia

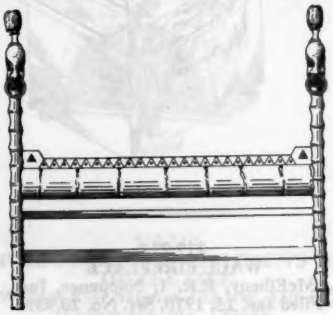
No Drawing. Continuation-in-part of application Ser. No. 566,480, July 20, 1966. This application Oct. 9, 1967, Ser. No. 673,975
Claims priority, application Germany, July 30, 1965, C 36,548
Int. Cl. C07c *103/30*
U.S. Cl. 260—559 5 Claims

Selected N - acylsubstituted - N - hydroxyguanidines are provided by the reaction of selected acyl carbodiimides with hydroxylamine or salts thereof. The substituted guanidines are useful agricultural chemicals particularly as herbicides.

DESIGNS

FEBRUARY 16, 1971

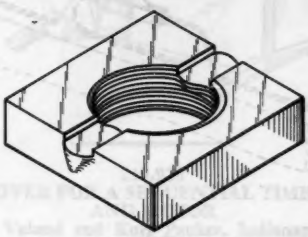
219,904
HEADBOARD FOR A BED
John H. Jordan, Jr., 8124 S. Crandon Ave., Chicago, Ill. 60617
Filed Aug. 29, 1969, Ser. No. 18,918
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4



219,905
KNOB
Adolf Gottwald, Iserlohn, Germany, assignor to Friedrich Grohe, Hemer, Germany, a firm
Filed Mar. 13, 1970, Ser. No. 21,897
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—145

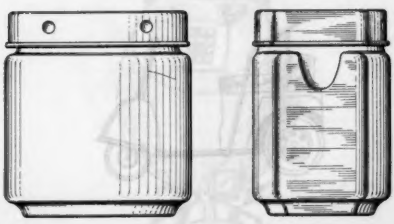
219,906
PULL
Martin R. Lambertz, New Hamberg, Ontario, Canada, assignor to Amerock Corporation, Rockford, Ill., a corporation of Connecticut
Filed May 26, 1969, Ser. No. 17,347
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—166

219,907
NUT
Arthur R. Breed, Euclid, Ohio, assignor to The Lamson & Sessions Co., Cleveland, Ohio, a corporation of Ohio
Filed Jan. 21, 1969, Ser. No. 15,411
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—274



219,908
BOTTLE OR SIMILAR ARTICLE
Ted L. Beaver, Roselle, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York
Filed Feb. 2, 1970, Ser. No. 21,259
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—61

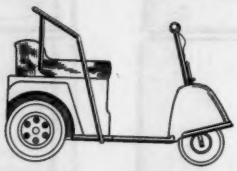
219,909
JAR
Clarke Hambley and Joseph Torres, Westchester County, N.Y., assignors to Chesebrough-Pond's Inc.
Filed Nov. 3, 1969, Ser. No. 19,904
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—163



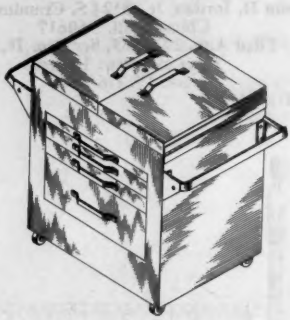
219,910
HOOK SUPPORT FOR CARRIER BAG HANDLE
Seymour Kamins, Oceanside, and Norman Rosenberg, Bayside, N.Y., assignors to CTP Industries Inc., Brooklyn, N.Y., a corporation of New York
Filed Oct. 9, 1968, Ser. No. 13,910
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—291

219,911
CARTRIDGE FOR AUTOMATIC BUNDLING STRAP TOOL
Laszlo Hidassy, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J., a corporation of New Jersey
Filed Oct. 27, 1969, Ser. No. 19,735
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294

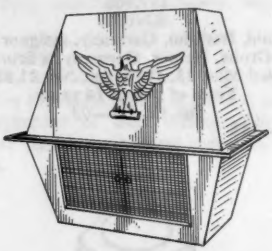
219,912
PORTABLE MOTORIZED CART
Edward N. Brennan, Tacoma, Wash. (10689D Maplewood Road, Cupertino, Calif. 95014), and Brian L. Brennan, 11616 Gorhame Ave. 6, Los Angeles, Calif. 90049
Filed Apr. 17, 1969, Ser. No. 16,798
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



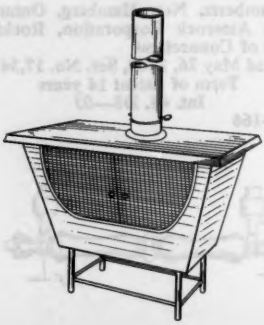
219,913
TOOL BOX
Howard R. Malm and Grace M. Malm, both of 3907 65th St., Sacramento, Calif. 95820
Filed Nov. 17, 1969, Ser. No. 20,122
Term of patent 7 years
Int. Cl. D12—*14*
U.S. Cl. D14—3



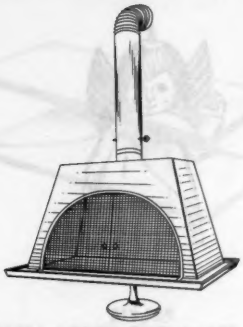
219,914
WALL FIREPLACE
Edwin L. McElheny, R.R. 1, Nappanee, Ind. 46550
Filed Jan. 15, 1970, Ser. No. 20,939
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94



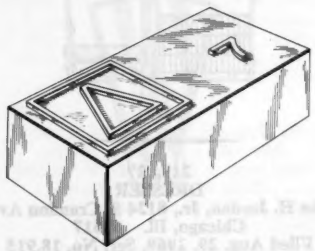
219,915
PREFABRICATED FIREPLACE
Edwin L. McElheny, R.R. 1, Nappanee, Ind. 46550
Filed Jan. 15, 1970, Ser. No. 20,938
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



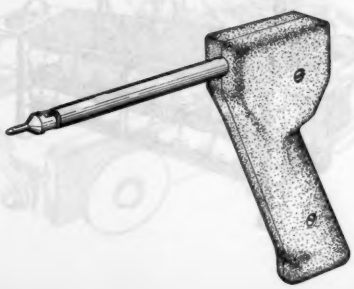
219,916
FIREPLACE
Edwin L. McElheny, R.R. 1, Nappanee, Ind. 46550
Filed Jan. 15, 1970, Ser. No. 20,940
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



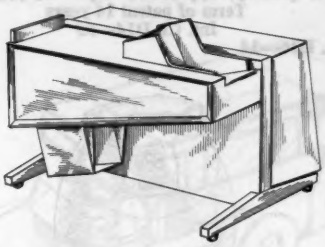
219,917
SET OF EDUCATIONAL CHILDREN'S BLOCKS OR THE LIKE
William King Skinner, 102 NW. 15th St., Gainesville, Fla. 32601
Filed Mar. 14, 1969, Ser. No. 16,253
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1



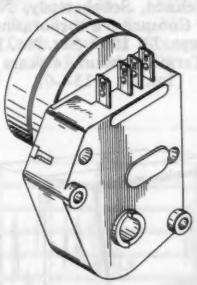
219,918
LEAK TEST VACUUM PROBE
Guy E. Mongodin, Huntington, and Leon Malmed, Hicksville, N.Y., assignors to Veeco Instruments Inc., Plainview, N.N.Y., a corporation of New York
Filed Aug. 6, 1969, Ser. No. 18,558
Term of patent 14 years
Int. Cl. D10—*11*
U.S. Cl. D26—1



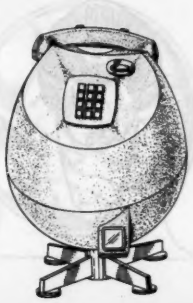
219,919
CARD READER
Norman Allen Cargill, Warminster, Pa., assignor to Peripheral Dynamics, Inc., Norristown, Pa., a corporation of Pennsylvania
Filed Jan. 21, 1970, Ser. No. 21,022
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



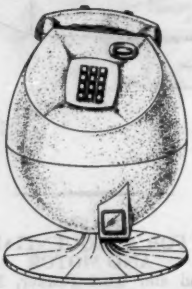
219,920
COVER FOR A SEQUENTIAL TIMER AND MOTOR
Elmo W. Voland and Kurt Pauker, Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind., a corporation of Delaware
Filed July 3, 1969, Ser. No. 18,050
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



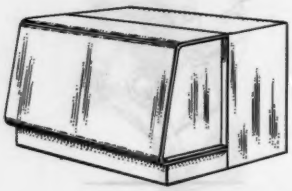
219,921
PUBLIC TELEPHONE OR SIMILAR ARTICLE
Akira Furusawa, Shin Iwabuchi, Chuta Aikawa, and Shoji Sakai, Tokyo, Japan, assignors of one-half each to Nippon Telegraph and Telephone Public Corporation and Tamura Electric Works, Limited, both of Tokyo, Japan, both corporations of Japan
Filed Nov. 6, 1969, Ser. No. 20,057
Claims priority, application Japan May 15, 1969
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



219,922
PUBLIC TELEPHONE OR SIMILAR ARTICLE
Akira Furusawa, Shoji Sakai, Chuta Aikawa, and Shin Iwabuchi, Tokyo, Japan, assignors of one-half each to Nippon Telegraph and Telephone Public Corporation and Tamura Electric Works, Limited, both of Tokyo, Japan, both corporations of Japan
Filed Nov. 6, 1969, Ser. No. 20,058
Claims priority, application Japan May 15, 1969
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



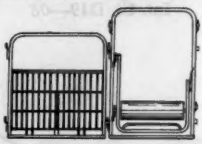
219,923
DISTRIBUTION TRANSFORMER
Alphonse J. Marchand, Schenectady, N.Y., assignor to General Electric Company, a corporation of New York
Filed Sept. 23, 1969, Ser. No. 19,263
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15



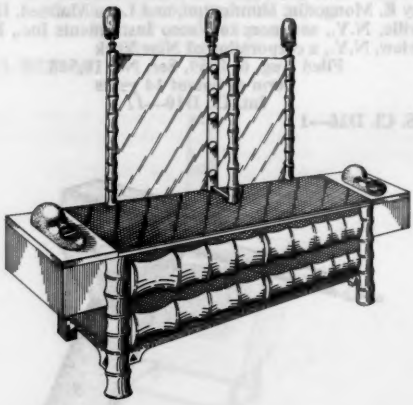
219,924
CHRISTMAS TREE ORNAMENT
Ramona McD. Trush, 67 Albany St., Cazenovia, N.Y. 13035
Filed Nov. 24, 1969, Ser. No. 20,260
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D29—1

219,925
CHRISTMAS TREE ORNAMENT
Ramona McD. Trush, 67 Albany St., Cazenovia, N.Y. 13035
Filed Dec. 8, 1969, Ser. No. 20,396
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D29—1

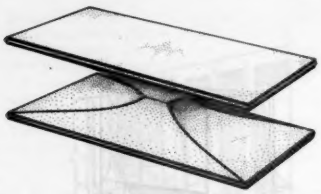
219,926
FARROWING PEN
Lyle W. Lage, Gladbrook, Iowa 50635
Filed Sept. 22, 1969, Ser. No. 19,248
Term of patent 7 years
Int. Cl. D30—*01*
U.S. Cl. D30—1



219,927
DRESSER
John H. Jordan, Jr., 8124 S. Crandon Ave., Chicago, Ill. 60617
Filed Aug. 29, 1969, Ser. No. 18,915
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—6

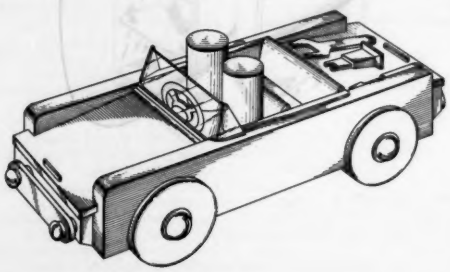


219,928
TABLE
Ralph S. Tincher, 4731 Babylon St., Montgomery County, Ohio 45439
Filed Sept. 26, 1969, Ser. No. 19,309
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—14

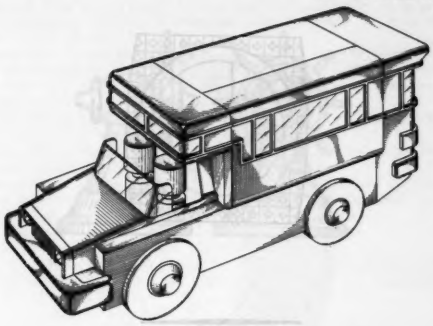


219,929
INDICIA COVER FOR GAME BOARD
Mark Herring, Scottsbluff, Nebr., assignor to James A. Warner and Margie Louise Warner, both of Scottsbluff, Nebr.
Original design application June 19, 1969, Ser. No. 17,776. Divided and this application Feb. 20, 1970, Ser. No. 21,533
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

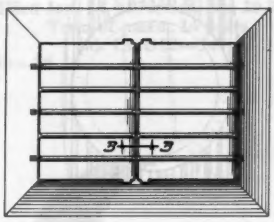
219,930
TOY AUTOMOBILE
Edward A. Fogarty and Marvin I. Glass, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill., a partnership
Filed Jan. 19, 1970, Ser. No. 20,992
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



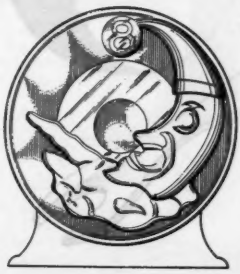
219,931
TOY CAMPER OR SIMILAR ARTICLE
Edward A. Fogarty and Marvin I, Glass, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill., a partnership
Filed Jan. 19, 1970, Ser. No. 20,970
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



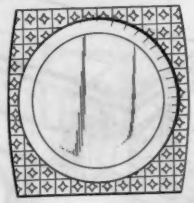
219,932
COVER UNIT FOR PARTICULATE MATERIAL SPREADER AND THE LIKE
Loren E. Tyler, 102 Chevy Chase Drive, Wayzata, Minn. 55391
Filed Sept. 2, 1969, Ser. No. 18,933
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D35—2



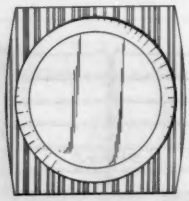
219,933
CLOCK
Theophile L. De Zinno, 1337 SW. 14th St., Miami, Fla. 33145
Filed June 20, 1969, Ser. No. 17,790
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7



219,934
PLATE OR SIMILAR ARTICLE
Eric Kurer, Hegnau, Switzerland, and Erich Hans Slany, Esslingen-Zell, Germany, assignors to Ornapress AG,, Schwerzenbach, Switzerland, a corporation of Switzerland
Filed Dec. 29, 1969, Ser. No. 20,657
Claims priority, application Switzerland Aug. 4, 1969
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

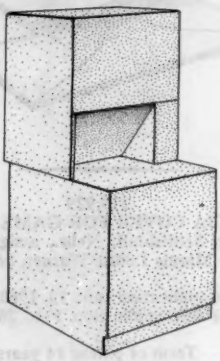


219,935
PLATE OR SIMILAR ARTICLE
Eric Kurer, Hegnau, Switzerland, and Erich Hans Slany, Esslingen-Zell, Germany, assignors to Ornapress AG,, Schwerzenbach, Switzerland, a Swiss corporation
Filed Dec. 29, 1969, Ser. No. 20,658
Claims priority, application Switzerland Aug. 4, 1969
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

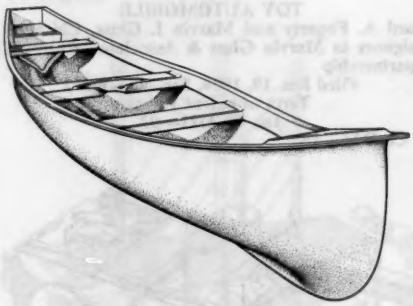


219,936
FORK OR THE LIKE
Clement P. Saila, 790 Bay St., Toronto, Ontario, Canada
Filed Apr. 1, 1969, Ser. No. 16,539
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D44—29

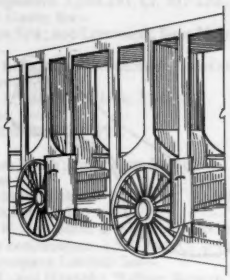
219,937
HOUSING FOR A COMBINATION WASHER-DRYER LAUNDRY APPLIANCE
Paul E. Petkwitz, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware
Filed Nov. 3, 1969, Ser. No. 19,889
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D49—1



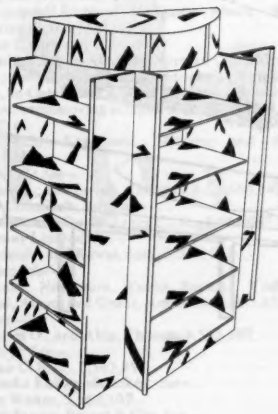
219,938
CANOE
Keith Duane Erickson, 3727 S. 900 E., Salt Lake City, Utah 84106
Filed Aug. 5, 1969, Ser. No. 18,546
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



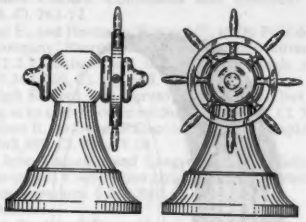
219,939
BOOTH UNIT FOR A LOUNGE OR THE LIKE
Billy Joe Walters, 1916 "B" Demer Road, St. Simons Island, Ga. 31522
Filed May 26, 1969, Ser. No. 17,326
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—2



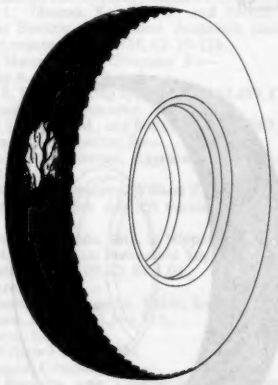
219,940
MERCHANDISE DISPLAY STAND
William S. Leath, Birmingham, Ala., assignor to Ebsco Industries, Inc., a corporation of Delaware
Filed Feb. 24, 1969, Ser. No. 15,865
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9



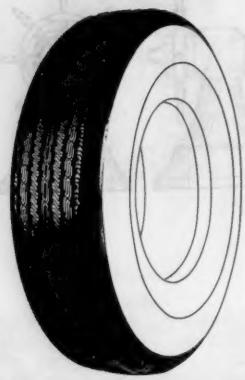
219,941
CIGAR CUTTER
Gosta Swanson, Box 26, Hollis, N.H. 03049
Filed Feb. 19, 1970, Ser. No. 21,524
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D85—7



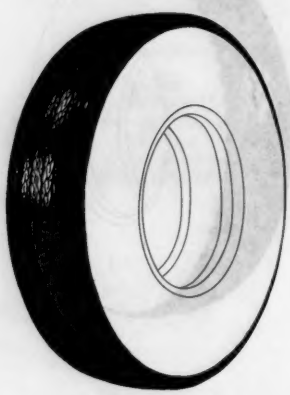
219,942
TIRE
John C. Smithkey, Jr., North Canton, and John R. Bauer and John H. Keck, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio
Filed Jan. 14, 1970, Ser. No. 20,927
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20



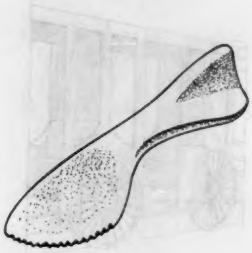
219,943
TIRE
Charles W. Roberts, Akron, Ohio, assignor to Lee Tire & Rubber Company, Conshohocken, Pa., a corporation of Ohio
Filed Apr. 27, 1970, Ser. No. 22,656
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20



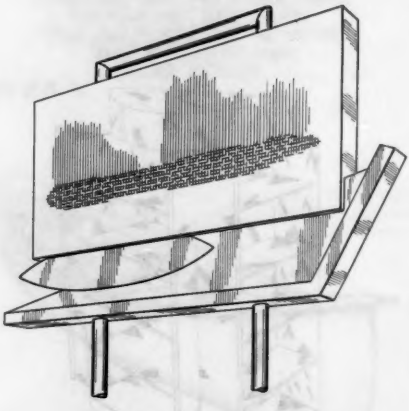
219,944
TIRE
Harold D. Fetty, Birmingham, Mich., and John K. Vohs, Union City, Tenn., assignors, by direct and mesne assignments, to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio
Filed May 15, 1970, Ser. No. 22,991
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20



219,945
COMBINED KNIFE AND SPOON
Clement P. Saila, 709 Bay St., Toronto, Ontario, Canada
Filed Apr. 1, 1969, Ser. No. 16,522
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D95—3



219,946
BILLBOARD
Carl A. Birnberg, 1641 Ford Parkway, and Henry S. Kristal, 1855 Pinehurst Ave., both of St. Paul, Minn. 55116
Filed Mar. 14, 1969, Ser. No. 16,240
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D95—12



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF FEBRUARY, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aagaard, Einar Andreas, to U. S. Philips Corporation, mesne. Electronic relay arrangement. 3,564,291, Cl. 307-252.

AB Elektroverken i Gavle: *See—*
Algotsson, Sven Erik; and Lorentzon, Sune Hugo Ivan, 3,564,112.

AB Tetra Pak: *See—*
Carlsson, Inge Lennart; and Andersson, Lars-Goran, 3,563,374.

Abbott, John G.: *See—*
Leier, Edward J.; and Edgar, Jack, 3,563,593.

Abbott Laboratories: *See—*
Harnden, Michael R., 3,563,992.

Abcor Inc.: *See—*
Cooper, William W., IV; and Pierce, Russell W., 3,563,889.

Abeck, Wilhelm: *See—*
Greiner, Joachim; Eichler, Wolfgang; Abeck, Wilhelm; and Muller, Erich,3,564,156.

Ackerman, Myron H., to Collins & Aikman Corporation. Necktie lining and neckwear construction. 3,562,814, Cl. 2-146.

Acorn Anodising Company Limited: *See—*
Kape, James M.; and Hannaby, William Berwyn, 3,563,867.

Acushnet Company: *See—*
LeGoff, Loman H., 3,564,586.

Adamovske strojirny narodni podnik: *See—*
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